

THE JOURNAL OF MEDICAL EDUCATION

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NEW (2nd) EDITION! Beckman—PHARMACOLOGY—The Nature, Action and Use of Drugs

See Saunders advertisement just inside

The Blakiston Division of McGraw-Hill presents:

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Outline of Physiology

*By L. L. Langley, M.A., Ph.D., 576 pp., 6 1/8 x 8 1/8, illus.,
In press*

On the basis of his teaching experiences, the author has written a carefully conceived work which surveys the general field of physiology. Each section and chapter is in itself complete with the result that the work is adaptable to all physiology texts, yet can be used equally well as a foundation or a review book. Such topics as the stop-flow analysis of kidney function, radioisotope techniques, counter-current hypothesis of urine formation are included in this OUTLINE OF PHYSIOLOGY.

Hematology in Practice

*By Steven O. Schwartz, M.D. and Wilson H. Hartz, Jr., M.D.,
425 pp., 7 1/4 x 9 7/8, 108 illus., \$14.00*

Hematology is considered in its broadest sense in this very practical text. Written to assist in the evaluation and treatment of patients, this work is divided into three parts to aid the reader in the identification, diagnosis and treatment of the disease. Line drawings, indicating the size of the liver, spleen, and other organs in each of the diseases or groups of diseases considered, provide an important guide from a diagnostic viewpoint of the clinician and student. The clearly written text with the numerous subheadings will also serve as an excellent reference and guide for the student.

A Functional Approach to Neuroanatomy

*By Earl Lawrence House, Ph.D. and Ben Pansky, Ph.D., 494
pp., 7 1/4 x 9 7/8, illus., \$12.50*

Prepared with the needs of the medical student continually in mind, this work presents basic neuroanatomy in an interesting style. Using a functional, yet systemic approach, the authors integrate clinical considerations into practically every chapter, including testing and symptoms of neurologic disorders. The inclusion of an atlas of brain sections enables the student to better orient his thinking and learning, while the addition of some actual case histories points up the importance of neuroanatomy to clinical practice. Every chapter includes a summary at the end which correlates the material in that chapter and aids the student's review of it.

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PHARMACOLOGY—The Nature, Action and Use of Drugs

Completely up-to-date for this new edition, this text is designed to give the student a clear and lasting understanding of therapeutics. It incorporates the very latest advances in pharmacology of such agents as the tranquilizers, the antibiotics, the chlorothiazide analogues and other diuretics, the anesthetics and analgesics.

The main section of the book covers action and uses of drugs. Classes of drugs are grouped according to their action on the body's function rather than by the type of disease against which they are effective. The text progresses

according to logical physiologic units. First come discussions of drugs that stimulate or depress muscle, then drugs relating to the blood such as those that lessen coagulability, those that combat hemorrhage—followed by drugs affecting the central nervous system, including those that lessen pain, those that quiet and put to sleep, those affecting moods and behavior, etc.

By HARRY BECKMAN, Chairman, Departments of Pharmacology, Marquette University Schools of Medicine and Dentistry; Consulting Physician, Milwaukee County General Hospital and Columbia Hospital; Editor, Year Book of Drug Therapy. About 746 pages, 7" x 10" with about 126 illustrations.

New (2nd) Edition—Ready in February

New (2nd) Edition! Guyton— Textbook of MEDICAL PHYSIOLOGY

With real understanding of the average medical student's scientific background and capabilities, this text sets forth essential facts about the functioning of the body and its component parts. The human body is presented as a single functioning organism controlled by a myriad of regulatory systems. Emphasis is on the automaticity of the life processes.

More than 120 physiologists aided Dr. Guyton in making this new edition virtually a new book. Their comments on the original text and the author's rewriting have simplified and

clarified the presentations of physiological mechanisms that students find difficult to understand. You'll find a new chapter on the physiology of infants and three new chapters on endocrinology and physiology of reproduction. 500 of the text's more than 750 illustrations are either completely new or carefully revised.

By ARTHUR C. GUYTON, M.D., Professor and Chairman of the Department of Physiology and Biophysics, University of Mississippi School of Medicine. About 1216 pages, 7" x 10", with about 774 illustrations.

New (2nd) Edition—Just Ready

plus up-to-the-minute help in fracture management

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Here is a careful evaluation of all significant advances in fracture diagnosis and treatment reported in the world literature since 1950. The authors also report the results of various methods of management in their own experience on fracture service at the Peter Bent Brigham Hospital.

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evaluation of polyurethane foam in cases of nonunion—three cardinal sins in hand splinting—"Boot-top" fractures in skiing accidents.

The material in this book has been reprinted from a series of articles which appeared in the New England Journal of Medicine in the early fall of 1960.

By THOMAS P. QUIGLEY, M.D., Assistant Clinical Professor of Surgery, Harvard Medical School; and HENRY BANKS, M.D., Clinical Associate in Orthopedic Surgery, Harvard Medical School. 102 pages, 5" x 7 1/2". \$2.50.

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INFORMATION FOR CONTRIBUTORS

The Journal of Medical Education serves as an international medium for the exchange of ideas in medical education, as well as a means of communicating the policies, programs, and problems of the Association. The Editorial Board welcomes the submission of manuscripts concerned with the broad field of medical education; this includes preparation for medical education; the medical school experience; intern and resident education; graduate and postgraduate medical education. The Editorial Board recognizes that medical education includes the activities of faculty, students, administrators, and those of the practicing profession who also teach and learn. Thus, it invites communications from any of these sources.

Manuscripts should be submitted in duplicate. All manuscripts are reviewed by the Editorial Board before acceptance for publication. All copy, including footnotes, tables, and legends, should be typed double-spaced. Each diagram or graph or photograph should have a brief legend. Each table should be typed on a separate sheet of paper. References should refer to published material only, must be submitted in alphabetical order, and should include, in order: author, title, journal abbreviation (*Quarterly Cumulative Index Medicus* form), volume number, page, and year; book references should also include editors, edition, publisher, and place of publication.

Galley proofs will be mailed to authors for correction before publication and should be returned within 48 hours after receipt.

Reprints may be ordered, when galley proofs are returned, in multiples of 100, at a price depending on the length of the article; prices are listed on the reprint order form.

Medical Education Forum includes editorials, letters, comments, criticisms, and excerpts from important addresses.

News from the Medical Schools: Material for this section should be transmitted to the News Editor, Miss Neva Resek, 2530 Ridge Avenue, Evanston, Illinois. Announcements of major faculty and administrative appointments, news of distinguished visitors and significant educational developments will be included. It is not possible to publish notices on grants-in-aid for scientific research.

Items of Current Interest: Audio-visual news and notices from national and federal agencies appear in this section.

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Address all correspondence concerning reprints, subscriptions, change of address, and back numbers to the Business Office, Association of American Medical Colleges, 2530 Ridge Ave., Evanston, Ill. All changes of address should provide both the old and the new address.

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Printed in U.S.A.

FIRST AID: DIAGNOSIS AND MANAGEMENT

By Warren H. Cole, M.D., F.A.C.S.

Professor and Head of the Department of Surgery,
University of Illinois College of Medicine

and Charles B. Puestow, M.D., F.A.C.S.

University of Illinois College of Medicine and Chief, Surgical Service,
Veterans Administration Hospital, Hines, Illinois, with 16 collaborating physicians.

The administration of first aid has become increasingly important during the past few years due to the increased hazards of travel and accelerated industrial progress as well as the establishment and maintenance of military forces in either active service or in training. Home accidents are increasing.

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Injuries to the Scalp, Skull, Spine,
and Nervous System

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Calendar of Meetings

ASSOCIATION OF AMERICAN MEDICAL COLLEGES

72nd Annual Meeting, Nov. 13-15, 1961
Queen Elizabeth Hotel, Montreal, Canada

1961

JANUARY

AMERICAN ACADEMY OF ORTHOPAEDIC SURGEONS, Hotel Americana, Bal Harbour, Miami Beach, Fla., Jan. 8-13. Mr. John K. Hart, 116 S. Michigan Ave., Chicago 3, Executive Secretary.

AMERICAN COLLEGE OF SURGEONS, SECTIONAL MEETING, Hotel Dinkler-Tutwiler, Birmingham, Ala., Jan. 16-18. Dr. William E. Adams, Am. Coll. of Surgeons, 40 E. Erie St., Chicago 11, Secretary.

FEBRUARY

AMERICAN ACADEMY OF ALLERGY, Statler-Hilton Hotel, Washington, D.C., Feb. 6-8. Mr. James O. Kelley, 756 N. Milwaukee St., Milwaukee 2, Wis., Executive Secretary.

AMERICAN ACADEMY OF FORENSIC SCIENCES, Drake Hotel, Chicago, Feb. 23-25. Dr. W. J. R. Camp, 1853 W. Polk St., Chicago 12, Secretary-Treasurer.

AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, Statler Hotel, Detroit, Feb. 8-10. Dr. Paul J. Whitaker, Allis-Chalmers Mfg. Co., P. O. Box 512, Milwaukee 1, Secretary.

AMERICAN COLLEGE OF RADIOLOGY, Drake Hotel, Chicago, Feb. 8-11. William C. Stromach, LL.B., 20 N. Wacker Drive, Chicago 6, Executive Director.

Congress on Medical Education and Licensure, Palmer House, Chicago, Feb. 4-7. For information write Mrs. Ann Tipner, A. M. A., 535 N. Dearborn, Chicago 10.

SOCIETY OF UNIVERSITY SURGEONS, University of Kansas Medical School, Kansas City, Kan., Feb. 9-11. Dr. Ben Eiseman, 4200 E. Ninth Ave., Denver 20, Secretary.

MARCH

AMERICAN ASSOCIATION OF ANATOMISTS, Pick-Congress Hotel, Chicago, Mar. 21-24. Dr. Louis B. Flexner, Dept. of Anat., School of Med., Univ. of Pa., Philadelphia 4, Secretary-Treasurer.

AMERICAN COLLEGE OF ALLERGISTS, Statler Hilton, Dallas, Tex., Mar. 12-17. Dr. Howard G. Rapaport, 16 E. 79th St., New York City, Secretary.

AMERICAN COLLEGE OF SURGEONS, SECTIONAL MEETINGS FOR SURGEONS AND GRADUATE NURSES, Hotels Bellevue-Stratford, Ben Franklin, and Sylvania, Philadelphia, March 6-9. Dr. William E. Adams, 40 E. Erie St., Chicago 11, Secretary.

AMERICAN ORTHOPSYCHIATRIC ASSOCIATION, Statler Hilton, New York City, Mar. 23-25. Dr. Marion F. Langer, 1790 Broadway, New York 19, Executive Secretary.

AMERICAN SURGICAL ASSOCIATION, Boca Raton Hotel, Boca Raton, Fla., Mar. 20-24. Dr. W. A. Altemeier, Cincinnati General Hosp., Cincinnati 29, Ohio, Secretary.

NATIONAL HEALTH COUNCIL, NATIONAL HEALTH FORUM, "HEALTH AND COMMUNICATION," Waldorf-Astoria, New York City, Mar. 13-16. Mr. Philip E. Ryan, 1790 Broadway, New York 19, Executive Director.

NEUROSURGICAL SOCIETY OF AMERICA (members and guests), Boca Raton, Fla., Mar. 8-11. Dr. Raymond K. Thompson, 803 Cathedral St., Baltimore 1, Secretary.

APRIL

AEROSPACE MEDICAL ASSOCIATION (32nd annual meeting), Chicago, Apr. 24-26. Dr. Willion J. Kennard, c/o Washington National Airport, Washington, D.C., Secretary-Treasurer.

AMERICAN ACADEMY OF GENERAL PRACTICE, Miami Beach, Fla., Apr. 13-20. Mr. Mac F. Cahal, Volker Blvd. at Brookside, Kansas City 12, Mo., Executive Director.

AMERICAN ACADEMY OF NEUROLOGY (members and guests), Sheraton-Cadillac Hotel, Detroit, Apr. 27-29. Mrs. J. C. McKinley, 4307 E. 50th St., Minneapolis 17, Executive Secretary.

AMERICAN ACADEMY OF PEDIATRICS, spring meeting, Sheraton-Park Hotel, Washington, D.C., Apr. 10-12. For information write Dr. E. H. Christopherson, 1801 Hinman Ave., Evanston, Ill., Executive Director.

AMERICAN ASSOCIATION FOR THORACIC SURGERY, Sheraton Hotel, Philadelphia, Apr. 24-26. Dr. Hiram T. Langston, 308 Carondelet Bldg., 7730 Carondelet Ave., St. Louis 5, Secretary.

AMERICAN COLLEGE HEALTH ASSOCIATION, Detroit, Apr. 26-29. Dr. Norman S. Moore, Cornell University Gannett Clinic, Ithaca, N.Y., Secretary-Treasurer.

AMERICAN COLLEGE OF OBSTETRICIANS AND GYNECOLOGISTS, Americana Hotel, Miami Beach, Fla., Apr. 21-28. Mr. Donald F. Richardson, 79 W. Monroe St., Chicago 3, Executive Secretary.

AMERICAN FEDERATION FOR CLINICAL RESEARCH, Haddon Hall, Atlantic City, Apr. 30. James E. Bryan, 250 W. 57th St., New York 19, Executive Secretary.

AMERICAN PHYSIOLOGICAL SOCIETY, Atlantic City, N.J., Apr. 10-14. Mr. Ray G. Dages, 9650 Wisconsin Ave., Washington 14, D.C., Executive Secretary.

AMERICAN PSYCHOSOMATIC SOCIETY, INC., Chalfonte-Haddon Hall, Atlantic City, Apr. 29-30. Joan K. Erpf, 265 Nassau Rd., Roosevelt, N.Y., Executive Assistant.

AMERICAN SOCIETY OF BIOLOGICAL CHEMISTS, INC., Atlantic City, Apr. 10-14. Mr. Frank W. Putnam, University of Florida College of Medicine, Department of Biochemistry, Gainesville, Executive Secretary.

AMERICAN SOCIETY FOR EXPERIMENTAL PATHOLOGY, Atlantic City, Apr. 10-14. Dr. J. F. A. McManus, Univ. of Alabama Med. Center, Birmingham, Ala., Executive Secretary.

AMERICAN SOCIETY OF MAXILLOFACIAL SURGEONS, Barbizon-Plaza, New York City, Apr. 17-20. Dr. Edward C. Hinds, P.O. Box 20068, Houston 25, Texas, Secretary-Treasurer.

New 1961 Book

Hubbard and Clemans—Multiple-Choice Examinations in Medicine

A Guide for Examiner and Examinee

By JOHN P. HUBBARD, M.D.

Professor and Head of the Department of Public Health and Preventive Medicine, School of Medicine, University of Pennsylvania; Executive Secretary, National Board of Medical Examiners

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This *new book* presents a clear understanding of the characteristics of multiple-choice examinations, with special emphasis on medical knowledge. General problems of measuring knowledge are discussed, including consideration of the relative merits of essay and multiple-choice methods. Construction and analysis of individual questions and of the examinations as a whole are taken up in detail. Methods of interpreting results are suggested. There is a sample test of 170 questions in the *Appendix*.

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New 1961 Editions

Buchanan—Functional Neuro-Anatomy

By A. R. BUCHANAN, M.D.

Professor and Head of the Department of Anatomy, University of Colorado School of Medicine, Denver

A re-arrangement of chapter order for this *new edition* brings into better focus inter-relationships between the "pyramidal" and "extrapyramidal" motor systems as they affect motor disabilities. New material is added to the discussion of the basal ganglia, and a descriptive orientation to the thalamus is included with the hypothalamus.

New 4th Ed. 377 Pages, 7" x 10". 273 Illus., 18 in Color. \$8.50

Boyd—A Textbook of Pathology

By WILLIAM BOYD, M.D.

Professor Emeritus of Pathology, The University of Toronto, Canada

Considerable change in the approach and in the text itself is immediately apparent in this *new edition*. New emphasis is on normal and disturbed physiology in relation to disease; new chapters have been added on immunity and hypersensitivity, derangements of body fluids and ionizing radiation; and new illustrations have been added to the virtually rewritten text. Every page has been reset in double column format.

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1. Everson, G. J. *Bases for Concern about Teenagers' Diets*. *Journal of the American Dietetic Association* 36:17-21, 1960.

2. Van Slyck, C. *Calcium in Urban Family Food Supplies*. *Journal of the American Dietetic Association* 39:1223-1226, 1959.

3. *Nutritional Status of USA*. *Bulletin 769, California Agricultural Experiment Station*, 1959.

4. Stearns, G. *Nutritional State of the Mother Prior to Conception*. *J.A.M.A.* 168:1655-1659, 1958.

5. Hard, M., and Esselbaugh, N. *Nutritional Status of Selected Adolescent Children*. *American Journal of Clinical Nutrition* 4: 261-268, 1956.

6. Johnson, E. K., and Rederup, C. *Diet and Nutritional Status of Iowa School Children*. *American Journal of Public Health* 45:464-471, April, 1955.



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By FLETCHER H. COLBY, M.D., Consultant, Massachusetts General Hospital; Urological Consultant, Lakeville State Sanatorium, Middleboro, Massachusetts, and Lemuel Shattuck Hospital, Boston, Massachusetts. Former Chief of the Urological Service, Massachusetts General Hospital, and Associate Clinical Professor of Genito-Urinary Surgery, Harvard Medical School

1961

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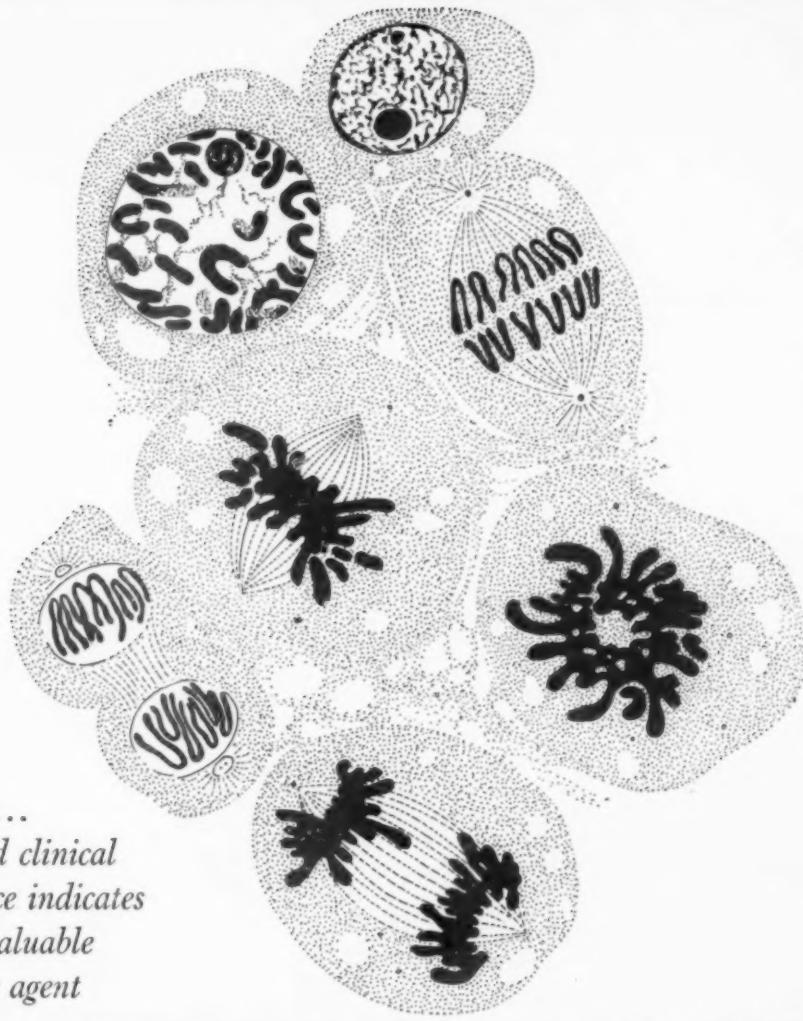
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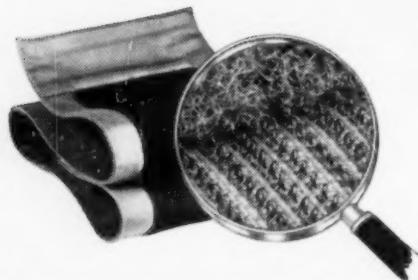
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⁶Papac, R.; Petrakis, N. L.; Amini, F., and Wood, D. A.: J.A.M.A. 172:1387-1391 (March 26) 1960.



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The Journal of MEDICAL EDUCATION

VOLUME 36 • NUMBER 1 • JANUARY, 1961

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The Journal of MEDICAL EDUCATION

VOLUME 36 • NUMBER 1 • JANUARY, 1961

Selling Drugs by "Educating" Physicians*

CHARLES D. MAY, M.D.†

Department of Pediatrics, College of Physicians and Surgeons,
Columbia University, New York

The traditional independence of physicians and the welfare of the public are being threatened by the new vogue among drug manufacturers to promote their products by assuming an aggressive role in the "education" of doctors. In the recent Congressional investigation of the cost of drugs it was repeatedly stated by executives of pharmaceutical concerns that a major expenditure in the promotion of drugs was the cost of "educating" physicians to use the products—and they mean doing what has always been expected of medical institutions. Is the public likely to benefit if practicing physicians and medical educators must perform their duties amidst the clamor and striving of merchants seeking to increase the sales of drugs by conscripting "education" in the serv-

ice of promotion? Is it prudent for physicians to become greatly dependent upon pharmaceutical manufacturers for support of scientific journals and medical societies, for entertainment, and now also for a large part of their education? Do all concerned realize the hazard of arousing the wrath of the people by an unwholesome entanglement of doctors with the makers and sellers of drugs?

That these are grave and pressing questions and not trivial fears should become apparent in the ensuing presentation of problems that surely deserve the serious attention of manufacturers, prescribers, and consumers of drugs. No one can be oblivious to the many fine contributions of both doctors and drug companies that certainly deserve the greatest admiration, but the dark side of things must be fully explored if the origins of the present problems are to be determined. The higher purpose of this analysis is to halt practices which are undermining sound medical care as well as degrading the reputation of the pharmaceutical industry and lowering the prestige of the medical profession—to a degree that has already aroused public concern and the probings of politicians.

After a general discussion of the deleterious practices, some specific proposals

* The author submitted this manuscript for critical review to the Physician's Council—an independent group of eighteen eminent physicians who organized in 1956 "to seek means of maintaining high standards for the material on health that is disseminated through the media of mass communication." The Physicians' Council wishes it to be known that it endorses this essay as an accurate, equitable, and constructive analysis of matters of major importance in relations between the medical profession and the pharmaceutical industry. Reprints will be available from the Physicians' Council, 2 East 63rd Street, New York 21, New York.

† Clinical Professor of Pediatrics.

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*Available for your
prescription or off-
brand physicians*

FIGURE 1

will be offered for preserving proper relations between physicians and manufacturers of drugs and thus spare them from unfortunate experiences in public investigations.

PROMOTION AS "EDUCATION"

Surely physicians realize that they cannot have faith in all drug promotion, but many assume that at least some reputable firms can be depended upon

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FIGURE 2

to consistently disseminate reliable information. The soundness of this assumption can be tested by a look at some current specimens of advertising. These items are from a considerable supply of the same kind, and regular scrutiny of the torrent reaching the physician will satisfy the curious that similar examples are easy to find. It will be seen that well known firms are guilty of sponsoring dubious "educational" material on topics of vital importance, and so the physician is left without any assurance of authenticity except from his own wits.

Antibiotics.—Antibiotics are therapeutic agents which no one can deny should be used intelligently and with discrimination. Efforts to influence physicians to prescribe these valuable remedies on an unsound basis would be particularly unfortunate; only clear and accurate information should reach the doctor.

For the past 3 years major pharmaceutical companies have been engaged in a competitive struggle to increase the sales of their particular brands of antibiotics by a confused and misleading barrage of promotion (Figs. 1-3). The exuberant campaign was based on meager and poorly controlled observations on the levels attained in the blood by

various preparations of antibiotics; additions of certain agents (phosphate, citric acid, glucosamine) were claimed to enhance the absorption of antibiotics and enable higher levels to be reached in the blood more promptly.

Soon after this hectic campaign was well under way, the premise was challenged (9, 14): actually, the action of these agents was to neutralize the unfortunate effects of fillers used in the capsules of the antibiotics—these were calcium salts that combined with the antibiotics and hindered their absorption. When the various forms of antibiotics are administered to fasting persons without fillers, no advantage is observed from addition of phosphate, citric acid, or glucosamine to the plain parent compounds (10). Furthermore, no sound evidence was ever brought forth that the levels and speed of absorption claimed for the widely heralded derivatives offered any practical clinical advantage or therapeutic superiority.

Pointed criticism from competent authorities did not check the eagerness with which the promoters undertook to "educate" the physicians with inadequate and irrelevant data and misleading claims in material distributed for the drug companies. Note the triumphant tone in the examples of promotional material from this campaign—this is the sort of inconsequential contribution the industry sometimes refers to proudly as the result of great investment in research in the companies' own laboratories. This achievement consisted of getting rid of the inhibiting effects of filler the manufacturer customarily used in the capsules of such products.

The "educational" effect on doctors was to confuse them and lead them to believe wonderful new drugs were available and that minor differences in blood levels and the rate of absorption are significant therapeutic advantages.



FIGURE 3

Similar tactics are now being applied to a derivative of penicillin (Fig. 4). The same substance is put forth under at least six brand names as if it were the discovery of each distributor. It is also slyly touted as synthetic penicillin when it is only a chemical modification of a fermentation product that is not isolated in pure form (15). The same chatter about higher levels being attained faster, without proof of clinical advantages, characterizes this latest "educational" material reaching the doctor. Once again evidence is lacking to prove the clinical superiority of the new derivative; the old penicillin V can

be absorbed about as well if administered on an empty stomach (13).

No amount of pleading (7) has discouraged the pharmaceutical industry from marketing and pushing products made up of mixtures of antibiotics. An example of low regard for the intellect of the average doctor is the promotion of Panalba by Upjohn (Fig. 5), where one is asked to believe an *in vitro* sensitivity test is a demonstration of clinical "performance in pneumonia" (no references to clinical trials). The nature of this combination is kept obscure by giving the company's brand names of the ingredients. What will this kind of "edu-

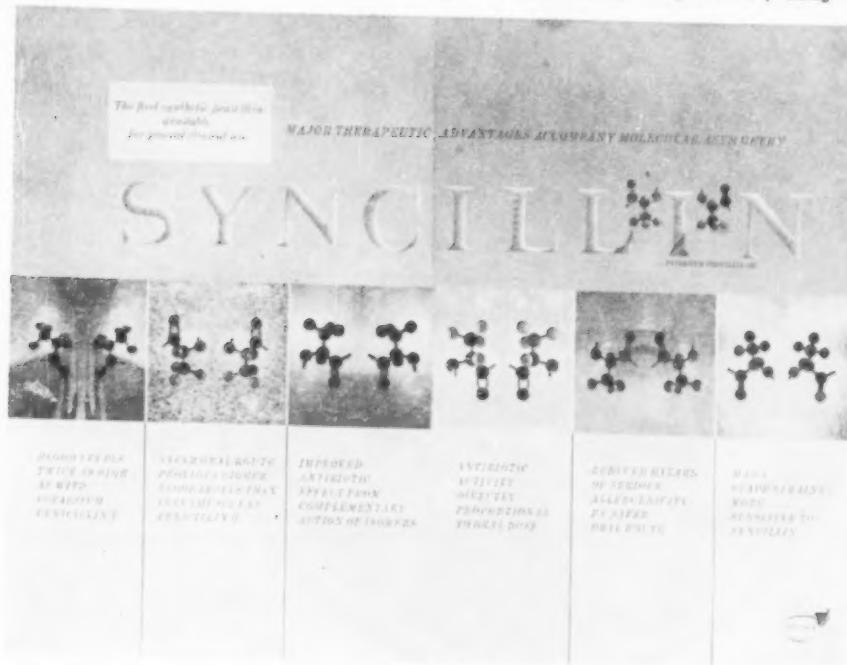


FIGURE 4

cation" do to the physician after a few years of domination of his habits and beliefs?

How can one gain confidence in promoters as educators or believe in their sincerity in view of these typical disclosures? There is an astonishing disregard for expert opinion and the complaints of responsible physicians even in the present trend to repeat the tactics that characterized the promotion of "potentiated" tetracyclines in the current advertising of "synthetic" penicillin.

The untrustworthiness of "educational" material employed to promote basic products is not peculiar to antibiotics. Similar disregard for the available evidence and for authoritative opinion can be seen frequently in the advertisements used by leading ethical pharmaceutical firms to instruct doctors,

REVEALING ECONOMICS

It has been estimated (1) that drug companies selling their products through doctors' prescriptions spent \$750,000,000 in 1959 on promotional activities. How much of this sum was truly directed to "education" is a moot question. Advertising in medical journals and by direct mail to physicians amounted to \$125,000,000. The expense of maintaining the army of 15,000 detail men busily engaged in spreading "education" must account for a huge portion. The remainder went for exhibits, films, trade publications, lectures, televised clinics, samples, etc. All this huge sum was in the last analysis devoted to one prime purpose—to get the physician to prescribe products of particular firms by brand names.

Whether various aspects of this immense promotional campaign are labeled

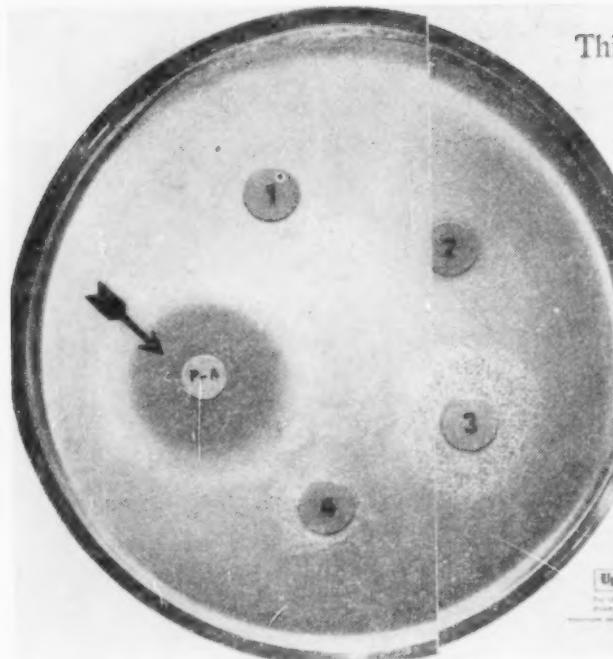


FIGURE 5

as advertising or education, the medical profession and the public cannot safely ignore its effects on either the cost or the physician's use of drugs. The success of the promotional activities depends on gaining an influence over the habits and beliefs of the prescribing physician ("the funnel through which all ethical drug sales must pass"). Two-thirds of the spending for drugs and medications is attributed to items prescribed or recommended by a physician or a dentist, and these absorb 20 per cent of the funds spent by the public for personal health care. Between 1952-53 and 1957-58 the expenditures for drugs and medications increased 120 per cent (1.5-3.3 billion dollars), but the spending for physicians' services rose much less, or 42 per cent (3.8-5.4 billion dollars) (18). The item of interest here is in

the share of the health dollar absorbed by expenditures for drugs (an increase from 15 to 20 per cent in 5 years) compared with the portion spent for physicians' services (a decrease from 37 to 34 per cent in 5 years).

Another way of appreciating the factors involved is to note the changing picture revealed by estimates of the increase in the use of drugs (in contrast to merely a *rise in the price of drugs*). In the 5-year period between 1952-53 and 1957-58 there was an increase of expenditures due to rising costs of drugs of only 9.5 per cent, but there was a 73.5 per cent increase in the use of drugs (18). Consider these figures in relation to the outlay for drug promotion in the same period: Between 1953 and 1958 expenditures just for advertising in medical journals and by direct

This is Panalba performance in pneumonia

... into a mixed culture of the three organisms commonly involved in pneumonia — *K. pneumoniae*, *Diphtheroid pneumoniae*, and *Corynebacterium diphtheriae* (in this case a streptomycin isolate) are introduced simultaneously.

Twenty-four hours later on this greatly enlarged photograph, note that only one of the five test-tube antibiotics has escaped off the sensitive medium, Panalba.

In your next pneumonia patient... in all your patients with potentially-serious infections... provide the extra protection with your prescription for

Panalba®

Penicillinase-resistant penicillin
The broad-spectrum antibiotic of first choice

Upjohn
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mail to physicians increased by 219 per cent to reach the all-time high of \$125,000,000 (1). By contrast, the total funds available to all medical schools in the United States for their educational programs in 1957 was only slightly greater, \$200,000,000.

THE QUESTION

There is no way of ascertaining the extent to which improvement in the health of the population is due to a contribution of the medical profession, the achievements of drug manufacturers, public health measures, or socioeconomic conditions. It is evident to everyone that the pharmaceutical industry has made an important contribution to the public health and to the treatment that can be administered by physicians. The pharmaceutical industry and the medical profession have come to occupy prominent places in our society, and we must deal with them as permanent and useful enterprises.

The principal subject under consideration here is the possible impact of promotion tactics aimed at "educating" the physician on the character of medical practice and on the extent and manner of use of drugs, and perhaps on an unnecessarily high cost of pharmaceuticals. Of equally fundamental concern is the need to examine the appropriate prerogative of each of the parties engaged in meeting the needs of the people for medical care. Only by a clear definition of their separate roles can the public be safeguarded from evil consequences of unsuitable entanglements between the manufacturers and prescribers of drugs.

The essential purpose of this inquiry is to search out the principles which will bring the trade and the profession into proper alignment in fulfilling their obligations to the people. The objective should be to cultivate cooperation without drifting unconsciously into a collab-

oration that could undermine the independence of the physician, the free enterprise system of trade, and be deleterious to the medical care of the public.

There is sufficient talent and idealism in industry and the profession to formulate a wholesome partnership, but unfortunately the best intentions of any group are liable to serious dislocation by the machinations of some eager specialists in promotion who may be oblivious to anything but personal gain. Undoubtedly some of the present problems stem from inadequacies in the profession, and these must be dealt with forthrightly.

TO EACH HIS OWN

A wise division.--The right to practice medicine granted to a physician by his license and the privilege given to others to manufacture and sell drugs are each derived through laws adopted by the people dependent upon their services. There is a vital division of responsibility and at the same time a joint obligation inherent in those arrangements. This must always be clearly recognized by the parties to whom the people have assigned a share in the guardianship of their health.

The working relations between the medical profession and the pharmaceutical industry were not formed easily, as though it were a natural and inevitable means of meeting the health needs of the people. There was a bitter struggle for several centuries between apothecaries and physicians for dominant control of both the privilege to manufacture and sell drugs and the right to prescribe treatment. The conflict was not resolved until late in the nineteenth century when the people, through the law of the land, segregated the right to prescribe from the privilege to trade in manufacture and sale of drugs. This safeguard was found necessary to protect the people from exploitation by any one group that

might stand to profit by prescribing remedies of their own manufacture.

Do not disturb.—The people would not tolerate for long any tendency to burdensome expenditures traceable to excessive influence of the manufacturer over selection of treatment or to uncritical use of costly drugs on the part of physicians. *Life* magazine (February 15, 1960) concluded a report of the recent Congressional investigations of ethical drug concerns by stating: ". . . in the long run it is up to better informed consumers to insist on being less captive and to pressure the doctors into using a finer discrimination." Neither the medical profession nor the pharmaceutical industry wishes to feel undue "pressure" from the public, and thus both have every reason to maintain wholesome working relations and a sense of joint responsibility in strict compliance with the welfare and wishes of the people who granted them their privileges. The division of responsibility must be truly respected and not disregarded through any subtle entanglement that may arouse the indignation of the people.

SOURCES OF CONFUSION AND CONFLICT

Legal loopholes.—A typical state law on medical licensure (New York) states that "a person practices medicine . . . who shall either offer or undertake by any means or method to diagnose, treat, operate or prescribe for any human disease . . ." Further, "No person shall practice medicine unless licensed . . ." This legal position of the physician is the basis of operation of the Federal Food and Drug Administration as set forth in the Food, Drug and Cosmetics Act as amended in 1952 which states that a prescription is required for "any drug which because of its toxicity or other potentiality for harmful effect, or the method of its use, or the collateral measures necessary for its use, is not safe for

use except under the supervision of a practitioner licensed by law to administer the drug."

This places the practitioner squarely in the path of the manufacturer and distributor of drugs which require a prescription; he must therefore be persuaded to use the drug if it is to be commercially successful. The physician becomes the prime target of promotional tactics and exposed to the craftiness of any unidealistic pursuers of profit.

It is not generally appreciated that the Food and Drug Administration is not empowered to control the claims made in the advertising of drugs regarding the usefulness of a product, but must restrict its concern to the safety and proper labeling of drugs distributed in interstate commerce. The Federal Trade Commission is assigned a responsibility in respect to false advertisements of pharmaceutical products distributed in interstate commerce, but somehow an interesting clause gained its way into the Act of 1914 outlining the powers of the FTC and has remained there to this day: "No advertisement of a drug shall be deemed to be false if it is disseminated only to members of the medical profession, contains no false representation of a material fact, and includes, or is accompanied in each instance by truthful disclosure of, the formula showing quantitatively each ingredient of such drug."

Thus it is evident the promoter has a remarkably free hand in seeking to influence the physician. In essence the attitude behind these Federal Acts is that the physician should be able to look out for himself in selecting drugs for treating patients and needs little protection from the law or regulatory agencies. This might be true if he did not have to contend with subtle overpowering promotion and the complexities of modern medicine, especially if he is

to be "educated" by the very purveyors of products which require his prescriptions.

Semantic smog.—The companies selling drugs through doctors' prescriptions have enjoyed the distinction of being referred to as in the "ethical" drug trade in contrast to the proprietary firms engaged in sale of drugs direct to the public ("over-the-counter"). Ethical as here used refers only to the channel of distribution and not to the manner and morals of promotion. The distinction becomes even less meaningful when companies deal in both routes of sale; many large "ethical" companies sell products in both categories or have subsidiaries in the proprietary field, and some proprietary firms have acquired control of ethical companies (6). A recent trend has been to expand the market for so-called "over-the-counter ethicals," i.e., products sold directly to the public but not generally advertised as yet in lay media. The Food and Drug Administration permits a product to be sold without a doctor's prescription when it is deemed safe to do so, and no objection comes from the profession after customary notification in the Federal Register. An increasing number of products are making this transition from the ethical to the proprietary realm each year (2). This should be of greater concern to the physician who may become by-passed excessively and the people urged to drug themselves directly by the manufacturer. The movement in this direction may be a considerable factor in the greatly increased use of drugs in the past 5 years, already mentioned. It is easy to see that the retail druggist can also be drawn into the struggle to influence the physician and the public to use particular brands of drugs.

DRUGS FOR MERCHANDISE OR FOR HEALING?

Temptations of bigness.—The difficulties in maintaining proper independence

of physicians from the sellers of drugs have been aggravated by the growth of the pharmaceutical industry to a "big business"—drug sales climbed to about 3.3 billion dollars in 1958. It has been predicted that this volume will triple within the coming 15 years (16). It is inevitable that such a promising market, unless carefully watched, will be the prey of fierce competition and the hard-hitting promotional tactics of the commodities market. This may be within the legitimate functioning of our free enterprise system of economy, but there are special considerations calling for restraint in seizing upon the public health as a commercial plum. Certainly the medical profession would be well advised to take care that the public does not come to believe doctors are too entangled with the hustling in the market place.

Manufactured complexity.—One result of the eagerness to share in the profitable business of making and selling drugs is an energetic effort to launch new products. At present about 400 new products are introduced by pharmaceutical companies each year (4). Actually, not more than forty of these are new chemical entities, most being slight modifications or different preparations and mixtures of established agents put forth with claims of advantages such as flavor or absorbability, etc. As a matter of fact, the really new drugs of material assistance in treatment, and requiring advancement in the knowledge of the physician for their use, probably amount to less than six compounds a year. Thus, the task of keeping abreast of significant new therapeutic agents is complicated for the physician by the difficulty of identifying these among the avalanche of minor variations, often heralded in the promotional material as striking achievements. The physician might not need so much "education" if there was

not so much duplication in brands produced for profit rather than to meet real needs of patients.

It is commonly believed that catchy brand names are better chosen for easy remembrance than proper or generic names for drugs, but see if the following list is familiar or informative.

UNREVEALING BRAND NAMES

Madribon	Medrol	Miradon
Marsalid	Mephyston	Moderil
Maredox	Meprolone	Monodral
Mebralal	Methium	Mulvidren
Medomim	Midicel	Mysoline

Any potential advantage of a catchy name is lost when one is faced with new trade names for 400 products a year for perhaps a tenth this number of different specific agents. One wonders whether the few generic names that actually should be learned could not be even better mastered than the numerous variants in brand names for a single drug, if comparable promotion ("education") were devoted to implanting the fewer generic names in the mind of the physician, for example:

SINGLE GENERIC NAMES FOR DRUGS WITH MULTIPLICITY OF BRAND NAMES

DEXAMETHASONE	PREDNISONE	TETRACYCLINE
Decadron	Delta	Achromycin
Deronil	Deltasone	Panmycin
Gammacorten	Meticorten	Polycycline

PHENETHICILLIN ("SYNTHETIC" PENICILLIN)

Alpen
Darcil
Syncillin
Maxipen
Chemipen

The argument that a brand name affords assurance of quality and purity because of a responsibility imposed on the company having exclusive rights to its use is unimpressive. This responsibility should be fully assumed by the Food and Drug Administration, which has the power of inspection and should have more means to exercise it. We do not need a complicated system of pri-

vate ownership of names of drugs to protect the public. As a matter of fact, drugs presently distributed by generic names have not often been found inferior in the limited inspections the FDA has been able to make.

It is evident that a vicious circle is created by a mad scramble for a share of the market: the doctor is made to feel he needs more "education" because of the prolific outpouring of strange brands but not really new drugs, produced for profit rather than to fill an essential purpose; and then the promoter offers to rescue him from confusion by a corresponding brand of "education."

THE STYLE OF PROMOTION

Smart and sly.—The goal of promotion, even when traveling a circuitous path under the guise of "education," is to achieve uncritical acceptance of a preconceived message—to captivate the mind; stimulation of skeptical thinking could block the purpose. This is in sharp contrast to the objective of true education, which seeks to cultivate the use of the mind for independent judgments. The success of promotion does not depend on the authenticity of the message but on the skill in manipulation of belief. The psychology of persuasion has been studied more assiduously and is better mastered by promoters than by professors. Not only are the rewards and competition in commerce stimulating, but the best techniques of promotion can be ascertained by the concrete measure of sales figures. The educator is hampered in evaluation of his methods because the results are deep in the mind and cannot be given specific price tags.

Preparation of promotional material is generally farmed out to specialized advertising agencies, and these have not always shown a notable sense of responsibility in their use of the mass media

in matters of health. It is to be expected that an advertising agency would be more concerned about the success of a promotional campaign than its impact on medical practice. Whereas medical men of integrity may be consulted in the preparation of promotional material, it seems that they may be overruled by executives occupied with maintaining sales and profits.

Payola?—In conjunction with the actual advertising material, the pharmaceutical companies go to great extremes to sell an appealing "House Image" to the physician to soften his resistance. Lowest on the scale are overt gestures like ordinary entertainment and personal favors. One "ethical" drug company (Eli Lilly) gives medical students new diagnostic instruments each school year to foster "the close association of our two professions," with the proud boast of having enlisted "the co-operation of the dean of your college!" A particularly regrettable maneuver is the exploitation of the natural sympathy between doctors and students by hiring the needy and unsuspecting student as a detail man (Pfizer, Schering).

More subtle wooing takes the form of conspicuously sponsored conferences and television clinics and give-away lavish medical magazines and newspapers sometimes made more fetching with pseudoculture and racy human interest. Grants are made in partial support of independent research, but these usually cover only part of the cost and tend to favor utilitarian studies; and the investigator may unwittingly find his results subject to exploitation (11).

Medical organizations are given monies to support a large part of their activities, and then are in a poor position to criticize practices that infringe on the prerogatives of the medical educator and imperil the knowledge of the physician.

The question might well be raised:

How does all this courting differ from payola?

Promotion is to commerce what propaganda is to politics. The physician, like the citizen, had better have a clear notion of its trustworthiness. In the application of information to the care of the ill, it is not enough for most of what is offered to be accurate; the difficulty of avoiding error is compounded when clever means of misleading the unwary are common practice. And remember, the physician is left by the present laws to look out for himself in matters of promotion to a considerable extent. New proposals are under consideration to remedy this situation.

Tricks of the trade.—Innumerable ingenious devices have been contrived to give promotional material an air of authenticity. Some of these can be mentioned to warn physicians to watch for them in "educational" material prepared by pharmaceutical concerns.

Reference is often made to unpublished data from "personal communications," "case reports in the company's files" which are collected at random, and even individual testimonials. None of these can be readily evaluated in an acceptable fashion.

Quotations lifted out of context are a favorite means of misusing sound sources, and inferior articles in the medical literature may be selected to support the claims even when superior work is available to refute them. Only one or two of an impressive list of references may have any pertinence to the claims being propounded. Certainly the copy writers cannot be counted on to evaluate the evidence critically.

There are a few privately owned magazines published in the format of medical journals that are favorite repositories for superficial studies and common sources for references in promotional material. One of these was edited and

published by a drug company that then used the references in its advertisements, thus having a handy closed system of quotation.

Implied endorsement by vague allusions to use of the product by "many" physicians or hospitals is expected to be convincing, as are the results of inadequate surveys showing "9 out of 10" answering a mail questionnaire favored the product although it is not mentioned that only a small percentage of those questioned bothered to answer.

The appeal to the eye is seldom neglected, but the mind may not be taxed at all with useful information as to contraindications, side effects, toxicity, etc. Least of all can one hope to find any discouraging data on actual or comparative cost of "new" preparations versus established forms of a drug.

THE PHYSICIAN'S PREDICAMENT

Learning made difficult.—The body of knowledge which should be assimilated by the physician is burdensome enough without complicating his access to it. The legitimate medical journals have multiplied like insects; one must now seek his information from 5,000 journals (over 600 in the United States alone) containing about 100,000 articles a year. These publications are almost all edited and written by amateurs in the skills of communication. The usual medical journal is more a repository of data than an organ designed to interest and enlighten the reader. There are plenty of sound articles if one can find time to locate them and dig out the information. Even the review articles tend to be pedantic. The bibliographic aids such as *Index Medicus* list all articles regardless of merit and are of no help in checking on current promotion because they are months behind the journals, which in turn are months behind the claims in advertisements based

on "personal communications," "exhibits," and "cases in the company's files."

Editors and publishers may seem to pursue their lonely ways without regard to duplication of effort or real concern for the practicing physician, but this is partly due to inadequate staff. Usually the editor snatches time from some primary task to turn out a journal as best he can without specially trained assistants. Quite limited resources are available to the editor for making the journal more attractive with art work and colored illustrations or more interesting through enlisting the aid of skilled writers.

Because of lavish expenditures for drug promotion, the income from advertisements is enough to make the owners of medical journals covetous of the profits. Two official journals of national societies can be cited as bracketing the field: One general journal publishes 6,000 pages of advertising a year, at \$1,100 a page, or an annual income of \$6,600,000; another specialty journal receives \$260,000 a year from 1,300 pages at \$200 a page. All the costs of producing these journals probably do not come to more than 60 per cent of the income from ads plus subscriptions, thus leaving 40 per cent for the owners. It would be hard to beat this as a profitable business, since the raw materials—the talents of the contributors—come free!

Most lamentable is the lack of concern for the authenticity of material in the advertising pages in medical journals, which almost outweigh the editorial text in bulk and influence. Few journals show signs of a determined effort to reject misleading advertisements, and in none are the standards of acceptance high enough. In this respect the owners of the journals exert a strong influence over editors, some of whom surely resent the encapsulation of the editorial text by objectionable material.



FIGURE 6

Advertisements in otherwise reputable journals are not dependable sources of education. Conflict between promotional "education" and scientific information in the editorial text appearing in the same professional periodical is dramatically illustrated by an article and an advertisement in the same issue of the *Journal of the American Medical Association* (March 5, 1960).

Wilkins (19) reviewed the experience with occurrence of female pseudohermaphroditism in 36 infants born of mothers who during pregnancy had been given norethindrone (marketed as Norlutin by Parke, Davis & Company), a synthetic progestational compound, as treatment for habitual or threatened abortion. The natural hormone, progesterone, does not cause fetal masculinization. Norlutin and similar synthetic compounds have androgenic as well as progestational effects. The masculinizing effects

of synthetic progesteroids can lead to the genitalia of female infants being mistaken for male, with dire consequences if they are reared as males and then subsequently feminize and menstruate at puberty; they may also be mistakenly assumed in the neonatal period to have congenital virilizing adrenal hyperplasia.

The same advertisement for Norlutin (Fig. 6) has continued to appear regularly in the *J.A.M.A.* for the ensuing 3 months since the article by Wilkins appeared in that journal; in spite of his warning: "During the past year or two, Norlutin has caused fetal masculinization with sufficient frequency to preclude its use or advertisement as a safe hormone to be taken during pregnancy." The advertisement contains no clue to this complication and no information that is "educational" or enlightening. The startled expression of the woman in this advertisement may have more significance than the artist intended!

The financial subsidy gained through advertisements is a doubtful blessing. The journals come to be regarded as profitable property and as vehicles for advertising rather than scientific periodicals. A journal with an eye toward the glitter of gold may become diverted from its proper function as an outlet of free and pointed criticism.

This lush support inflates the number of publications beyond the natural needs, and the plethora of pages encourages acceptance of inferior articles—and so the bulk with which the reader must grapple is bloated as a consequence of the very promotional material he ought to check against a discriminating literature.

Little wonder that few physicians have the stamina to struggle with the overwhelming task of keeping abreast of new developments through their own medical literature. Medical educators must be especially chagrinned to have succeeded no better in cultivating sound reading habits in students that should last through the lifetime of a busy doctor, and to have done so little to keep the medical literature serviceable and free from external influence.

Believing made easy.—The deficiencies in the medical literature and shortcomings in the education of physicians have provided the golden opportunity for the promoter. The intense discomfort the doctor feels from the frustrations of using his own literature makes him quick to turn to the appealing "educational" material of the pharmaceutical concerns.

The sellers of drugs have launched an impressive array of publications (the paramedical literature) and other devices to gain an influence over the habits and beliefs of doctors. Envious skill and ingenuity have been devoted to production of attractive and well composed material. It cannot be denied that much of this is dignified and more useful than the journals and postgraduate programs sponsored from within the profession. The temptation to the busy physician, driven by desperation to seek short-cuts through the forbidding jungle of academic creations, is so great that in all probability the readership of the trade publications far outstrips that commanded by professional sources. Less harm would be done if the "educational" material furnished in behalf of promotion was free of bias. It is risky to depend on materials beyond the scrutiny of independent editorial staffs and of necessity dedicated to vested interests.

Tardy and taxing aids.—Valuable reports on the nature and use of drugs by authoritative bodies are regularly published, e.g., the Councils of the American Medical Association and the National Research Council. One might suppose the physician would use these to judge the accuracy of material reaching him through the channels of promotion. Reports such as these are widely scattered in medical journals or appear as separate documents not generally received by many practitioners. It would be a tremendous task for an individual to keep track of all these reports. Compila-

tion of critical evaluations by committees takes time, and publication of their reports lags too far behind the current promotional campaigns to apply the findings when they are most urgently needed.

Even if such reports could be more timely, a busy physician does not have time or energy to check the claims in promotional material by searching out corresponding statements from comprehensive authentic reports. It is absurd to expect the truth to prevail when it is given relatively slight circulation in a single publication or is repeated at rare intervals, while promoters have discovered that their message can be hammered home against great odds by massive relentless repetition.

Another limitation of most scholarly reports is the polite reluctance to single out specific products deserving criticism, as could be done by naming brands or identifying fallacious presentations in promotional material by direct reproduction and quotation.

A notable effort is being made to overcome these inadequacies by an independent group of competent physicians who are circulating a *Medical Letter*¹ containing pointed comment on the newest products while they are still being intensively promoted.

Unfair competition.—Advertising experts maintain that their methods would not be so successful if medical educators and editors did their jobs better and physicians were so well informed that they could not be influenced by unauthentic promotional material. There is enough truth in this to make sincere professors and editors wince, but the sides in the battle to dominate the habits and beliefs of the physician are not fairly matched.

As things operate in our society, far

¹ Published by Drug and Therapeutic Information, Inc., 130 East 57th Street, New York 22, N. Y.

larger resources can drift into the hands of pharmaceutical enterprises than can be raised by medical schools and professional organizations. While spending about \$125,000,000 in 1959 on journal and direct-mail advertising alone, the "ethical" drug industry placated the deans and professors with donation of an unrestricted sum of approximately \$243,000 as their mite to the National Fund for Medical Education (3), or about 0.12 per cent of the total budget of \$200,000,000 for medical schools for that year.

To a large extent the paramedical publications thrive as parasites on the basic contributions of the profession. They may select what they wish and remodel it to their purpose without the tedious task of doing the original work. The drab and prosaic legitimate journals must limp along on relatively meager resources openly raised through paid subscriptions or stoop to sharing the promoter's bounty by carrying his advertisements, which enshroud and often conflict with the editorial text. The beautiful and exciting magazines and newspapers from industry can be given away, whatever the cost, because the expense is conveniently included in the price of products the physician is led to prescribe.

Alarming trends.—Only a lapse of judgment can account for the willingness of prominent medical authorities to contribute their talents to further embellishment of the contents of the paramedical literature and other promotional schemes, as is increasingly the custom. A moment's reflection should make them realize that dominance of physicians' "education" can easily pass into the hands of those who are capturing doctors' attention with their aid and for the client's purposes. As an example, one handy little parasitic commercial magazine offers pithy extracts from the

legitimate literature sandwiched between fulsome advertisements, and frequently manages to draft an illustrious panel of professors who seem content to sell rehashes of their original works to dress up the collection of abstracts gleaned from proper journals—presumably to the owner's great profit.

Prominent men seem ready to lend their names as sponsors and thus add an air of authenticity, not only to paramedical magazines, but also to subtle schemes for closed-circuit television performances and for piping information and promotion into the offices of doctors via radio and phonograph and telephone; all these devices are subject to the influence of the advertising agencies and drug companies which support them.²

These entanglements can become confusing and unwholesome; cooperation can unconsciously come perilously close to collaboration. The net result is to undermine the audience for the journals and postgraduate programs which were once the prerogative of the profession.

² Examples are:

The Advisory Committee for Grand Rounds (television), made up of distinguished names, with headquarters at the same address as the largest medical advertising agency (William Douglas McAdams), and a lay employee of that company is the Executive Director for the Committee.

Voice of Medicine, a phonograph record service, teams up Excerpta Medica Foundation with Recordo-Med, Inc.

Medical Radio System is a service of RCA-NBC for special FM radio broadcasting of medical news and promotion.

Mediphone (developed by Johnson and Lanman ad agency) will arrange for free telephone calls between physicians seeking information on any topic and drug companies which will seek the chance to provide it.

The fate of Dr. Henry Welch, who was obliged to resign as chief of the Division of Antibiotics of the Food and Drug Administration, should be a warning to others drawn into promotional enterprises. His involvement in the schemes and dealings of two profitable trade magazines (distributed free to doctors) was brought to light in a Congressional Hearing (17).

Furthermore, a mass medium is established beyond the influence of the profession which can be used to comment freely upon the affairs of doctors, while their own private and official medical publications must hesitate to examine the doings of the industry upon which they have come to depend for subsidy. When the medical audience has been more completely won over by the promotional "educational" activities, and if the pinch of a less flourishing economy should be felt, what is to prevent the subsidy to medical journals and societies from being decreased? Would enough loyalty of doctors to their own professional journals remain to make it risky for industry to force these journals to rely on their own resources?

THE POWER OF PROMOTION

At times the effectiveness of promotion may be exaggerated by the promoters. They are not so powerful as to excite fear and worship, but it would be foolish to discount the impact of their efforts. Keen businessmen do not continue to lay out huge sums without results.

The aim of the promotional campaign is to sell a particular brand of a product. Listen to the terms mentioned in discussions of treatment by students in the classroom, by residents in staff conferences, or whenever doctors meet, and you will note how successfully trade names have been implanted—even though the brand name may not be simpler than the generic term and it may not give any clue as to the chemical nature of the product. Also notice how quickly a new product gains favor in the best of medical circles, whether proved superior to an old product or not.

If your own observations are unconvincing, look at the following sales figures of a few "ethical" products and ask yourself if discriminating authorities could be recommending such profligate

usage to residents and practicing physicians.

ESTIMATED TOTAL ETHICAL DRUG SALES AT MANUFACTURERS LEVEL (1957) (8)	
Antibiotics	\$406,000,000
Vitamins & Hemantinics	230,000,000
Adrenal hormones	88,000,000
Other hormone preparations	50,000,000
Sulfonamides	42,000,000
Biologicals	150,000,000
Tranquilizers	195,000,000

Promotion has the power to lift a product to prominence regardless of its usefulness, and though this may be a fleeting accomplishment, the "education" of physicians will be distorted and the resources available for health care will be dissipated by the hectic campaign to influence the doctor's prescription. Your attention is not being directed to a harmless "tempest in a teapot" but to a force that can twist the profession from a true course.

THE POWER OF CRITICISM

There is a remarkable dichotomy in the prevalent attitude in the medical profession toward criticism. Forthright public comment is expected from colleagues who review scientific books and articles for medical journals and during scientific meetings, but any tendency to comparably open criticism aimed at particular brands and specific abuses in promotion is frowned upon as "negative" and unsuitable for dissemination in the medical literature. Thus, a valuable exercise in the evaluation of evidence is eliminated from the continuing education of physicians from within their own ranks.

Other fields have not hesitated to employ higher criticism to foster good taste and excellence. Dramatists, authors, and artists are continuously exposed to unfeigned critics who pass judgment on their creations without sparing mention of individuals and specific works. Indeed, the full benefit of higher criticism

cannot be gained by vague generalizations alone.

That this procedure is equally constructive when applied to promotional material was demonstrated to the profession by the effect of a series of pointed criticisms published in a lay magazine in the past year. The *Saturday Review* (January 3, September 5, 1959) permitted their science editor to point out a few abuses in promotional material of a major ethical drug firm. Reproductions of actual advertisements for specific brands were used to illustrate the reasons for concern. The effect was salutary. These articles were so disturbing to the profession as well as the public (and the company under fire could not deny their validity) that the Federal Trade Commission was stimulated to issue two injunctions calling for explanations from the offender. Such action had not been taken previously by the FTC in connection with the promotion of ethical drug firms, presumably because it was deemed sufficient to let the doctor look out for himself as was stipulated in the Act of 1914 (quoted in a preceding section of this essay). Far from being "negative," this was a positive service to the public and the profession.

It does not seem sensible for the profession to relegate the function of higher criticism in medical affairs to even enlightened laymen, particularly in public media. The results may not always be so fortunate for doctors, and the public may view a reluctance on the part of the profession to assume responsibility for independent criticism of any agencies affecting the public health as a form of negligence (12)—in which case the privilege may be assigned to a governmental bureau. This turn of events would seem more likely to lead directly to excessive regulation of industry and the profession than the superficial notions of "censor-

ship" set forth by promoters to hold potential critics at bay.

Criticism from individuals submitted privately to drug houses is easily dissipated by polite evasion, but public comment cannot be dealt with so conveniently. The profession needs to bring its collective weight to bear on abuses and poor taste through pointed criticism in official journals of medical societies or by some form of public expression of pointed opinion from independent groups of physicians.

BUGABOOS

Censorship.—Whenever the suggestion is made that the consumer deserves more protection from unrestrained promotion, cries of "censorship" are heard from the captains of industry and the masters of the mass media. This word "censorship" is made more repulsive by opposing it to "freedom" and the sanctity of "self-regulation." The hackneyed trick violates sound concepts. To censor is to suppress expression of fact or opinion—and this is evil. To oppose abuses in the use of the mass media for promotion by pointed public criticism is not censorship but legitimate restraint—in the best tradition of freedom.

Censorship is abhorrent to all who aspire to freedom, but articulate criticism in the higher sense cannot be construed as unwarranted restraint or an infringement of rights. Freedom can be maintained only by providing for continuous, unhampered expression of opinion from all parties through equal access to the media of mass communication. There must be comparably effective presentations to the identical audience at nearly the same time; an open clash of opinion between fairly matched adversaries will finally disclose the closest approximation to the truth. This process is stifled when industry can afford to make blatant use of the mass media, while the profession remains content to express

its opinion softly through outlets partially stilled by a feeling of dependency on subsidy from advertisers.

Self-regulation is a myth not likely to be realized outside Utopia. Neither citizens nor nations, professions nor trades have evolved to this day that deserve such trust, least of all when profit is at stake. It is actually presumptuous to seek exemption from that degree of regulation which safeguards the welfare of all members of society.

Socialism.—Whenever the pharmaceutical industry feels the sting of political probing, as was so apparent in the recent Congressional investigations, the most promising means of eliciting sympathy from the profession is to play on the fear of socialized medicine (5). It is argued that if private industry is subjected to further government control, medicine will soon be the next target. It cannot be denied that should the profession become too closely entangled with the drug industry, they are liable to rise and fall together in the estimation of politicians and the people.

Physicians will have to recognize the purpose of these bugaboos or they may unconsciously accept a flimsy pretext for unbridled use of the mass media and adopt an unreasonable attitude toward social advances.

THE ENTICING WEB

A look at the entire net cast out by the promoter to catch the physician's favor will reveal how easily the unwary could become entangled. The suave and mischievous methods used to entice doctors into this web are deplorable: the whole is camouflaged as a noble plan to promote the public health and made tempting to the unsuspecting victims by the bait of "education." The grand scheme appears to be to confuse and then capture the prey.

The capacity for entangling doctors built into the network of promotion and

"education" spread out by the ethical pharmaceutical industry can be readily estimated by simply listing some familiar elements in the design.

1. Entertainment and gifts (wining, dining, and floor shows, free supplies and equipment to individuals and institutions) that soften resistance to overt promotion.

2. Subsidies of medical journals through advertisements and of medical societies through direct support of activities and indirectly by commercial exhibits at meetings—that interfere with their function as outlets for objective criticism.

3. Grants for applied research and testing of products—with the risk of ensuing exploitation of favorable results.

4. Sponsorship of conferences—thus made vulnerable to infiltration by tradesmen and biased presentations.

5. Free distribution of lavish and beguiling paramedical publications, radio and television programs (exempt from independent review)—that draw the attention away from legitimate medical outlets and transfer dominance of the mass media to the promoter.

6. Attractive invitations to talented physicians to contribute to paramedical publications—that divert their talent from publications of the profession and add a veneer of authenticity to the promotional "educational" material.

7. Manufacture of a plethora of brands and preparations—that complicates the burden of keeping doctors informed without corresponding enrichment of the therapy at his disposal.

8. Clamorous competitive claims—that permeate the practice of medicine with the confusion of huckstering in the market place.

9. Loose allusions to censorship and socialism—that startle conservative freedom-loving physicians.

10. Modest unrestricted contributions

to the profession's own educational enterprises (like the National Fund for Medical Education)—that may exonerate the abundant expenditures for industry-dominated "educational" programs.

The individual physician is left to escape this enticing web with too little help from his un-united, cautious, subsidized organizations, while the ethical drug companies have combined their resources in a Pharmaceutical Manufacturers Association that can effectively pursue a coherent plan and ample use of public relations experts to guard their interests.

THE MENACE OF ENTANGLEMENT

The prospect for free pursuit of a chosen trade or profession affecting the public health is most promising when the welfare of the people governs all actions. This means no selfish effort should be made to intrude upon the prerogatives of others or to exert undue influence through entanglement, confusion, or collaboration among the parties to whom the people have assigned separate responsibilities.

The invasion into the province of the medical educator by the drug companies must be eliminated; conscription of "education" in the service of promotion must cease. Sooner or later what may now seem like benign and noble overtures will be recognized as ominous intrusion that threaten the hard-won and reasonable boundary between the sellers and prescribers of drugs.

Neither the drug industry nor the profession would profit by mortal combat, and the public would be the victims of unseemly collusion. There is only one way to better health care for the people—cultivation of cooperation and avoidance of entanglements. If the public is the first to sense the danger, matters will pass into their hands and governmental regulation will be made the order of the day.

PROPOSALS TO LOOSEN THE PROMOTER'S SNARE

To physicians.—It would not be surprising to find that some physicians react with anger at any criticism of ethical drug companies, for surely all the bountiful gestures from industry must have forged some warm friendships. Let them hold their fire and consider!

There are ample grounds for kindly feelings between doctors and those who furnish them with invaluable remedies without the ardent wooing of promotion. However, as long as the prescription remains the means to a sale, short-sighted promoters will consider it "good business" to make prescribers feel something close to kinship with the purveyors of drugs. This is a shaky foundation for true and lasting friendship. A little reflection should lead physicians to beware the eroding effects on their traditional independence and on the trust they have received from the people.

Doctors must adopt universal skepticism toward "educational" material emanating from sources outside their own publications and institutions, and even these will be suspect so long as there is any reluctance to apply critical standards in acceptance of advertisements, or to speak out freely on other abuses, for fear of losing the subsidy of promoters. The legitimate medical literature needs overhauling, as to both source of support and techniques of communication.

In addition to looking out for himself the physician must be willing to pay his own way. He would bridle at the prospect of being considered a "sucker," or a puppet of any vested interest—a possibility he faces when he becomes beholden for entertainment or deeply entangled in the web of promotion. Never forget that the patient pays the bill.

Physicians should not discount their latent power nor hesitate to assume their full stature and call a halt to invasion

of their province. Prestige is a fragile flower that demands conscientious cultivation to save it from pests and weeds blown in by the winds of promotion.

In the light of reason the bugaboos of censorship and socialism will be dispelled, and the indispensability of higher criticism for maintenance of excellence and good taste will be acknowledged.

Watchfulness will be required to check the increasing transfer of products from "ethical" channels into the category of "over-the-counter ethicals," a source open to patients without recourse to a doctor's prescription. Casual tolerance of this trend is a form of professional suicide, which might be a boon to promoters, but not to the people, who appear only too anxious to drug themselves at the beckoning of unscrupulous hucksters.

In essence, physicians should hold themselves aloof in unhampered devotion to their calling, while exchanging a wholesome respect with others contributing to the public health but never being guilty of prescribing drugs under unconscious influence of personal favors or subtle entanglement with the affairs of drug manufacturers; nor can the profession ever shirk the task of setting its own house in order, particularly with regard to the unkempt medical literature, to inadequacies in the techniques of medical training, to easy-going ways of financing activities of medical societies, and to indulgence of wayward physicians who may be unwittingly aiding and abetting the schemes of promoters.

None of these proposals should be allowed to provoke conflict between the groups making equally vital contributions to the public health; the best interests of all parties can be fostered only by suitable cooperation, which is distinct from collaboration. Conferences between responsible representatives of medical educators and the pharmaceutical industry would be desirable, e.g., the

Association of American Medical Colleges and the Pharmaceutical Manufacturers Association.

To the ethical drug firms.—The position of managers of drug companies dependent on doctors' good will to sell their products is not altogether enviable. It takes a reasonable profit to make the stockholders happy, and this must be gained in a fiercely competitive market. The manufacture of drugs is an exacting business, not only because of legal standards but because imperfections in the product can be disastrous and no excuses will satisfy the public. There are enough internal problems in such an industry, but a final obstacle must be overcome before the volume of sales will permit a profit—the man who writes the prescription must be won over to favor the product. The great body of preoccupied, conservative, and proud physicians is no slight obstruction to place in the path of any enterprise; little wonder a great blast of promotion was found necessary to move them.

Even allowing for all these difficulties, the ethical drug firms may have over-shot their mark. Physicians and the public are beginning to feel they are pushed around too much. Unless the medical educator is completely overpowered, sooner or later there will be a wholesale opposition to pharmaceutical invasion of the field of medical education. To be sure doctors and their organizations are notorious for accepting almost any offer of subsidy or entertainment, but their feeling of gratitude will not be strong enough to check their ire when they realize their prerogative to exercise dominant influence over the habits and beliefs of physicians has been bought.

Ethical drug firms should reconsider the appropriateness of attempting to influence physicians by subtle infiltration into the educational process and through a vast meddlesome subsidization that is

hard to distinguish from payola. If the pharmaceutical industry can afford to subsidize medical affairs, they should do so through larger unrestricted contributions to organizations devoted to the interests of the profession, such as the National Fund for Medical Education, rather than allowing their resources to be used as a means of undermining the control of physicians over their own affairs or as a nefarious scheme of public relations.

Matters would improve if the ethical drug industry shook off the exuberant promoters who have drawn them into the use of techniques customary in the sale of ordinary commodities but highly questionable for application to promotion of medical remedies. This industry had better take another look at that word "ethical" and make certain its meaning is applied to the manner of doing business and not just the channel of distribution of their products.

No doubt it would be impossible to curtail the plethora of brands and preparations of products in a *laissez-faire* market. This is one of the chief causes of promotional puffery and an aggravating contribution to the confusion of the doctor that makes him feel he needs more "education." The Pharmaceutical Manufacturers Association might well consider whether its members would in the long run be better off with lower sales volume and less bigness and less aggressive competition—the alternative appears to be an ever-increasing tempo of promotion until the whole business is discounted by the profession and the public. The promotional campaigns which are required to compete in a market depending on sales direct to the public are especially costly; the last barrier to this drain will be gone if the physician is removed from the path of drug promotion by loss of stature or further tendency of ethical firms to get around the

doctor via the "over-the-counter ethical" line of remedies. Acquisition of proprietary subsidiaries by ethical firms and vice versa must complicate matters.

Cooperative projects.—A good step in the right direction has been the adoption of a Statement of Principles of Ethical Drug Promotion by the members of the Pharmaceutical Manufacturers Association. The next step is to abide by it faithfully. Even better would be a really comprehensive statement of principles prepared and adopted jointly by representatives of industry and the profession to define and govern their proper relations and separate prerogatives. This could be coupled with the establishment of a Board of Overseers made up of representatives of the public, industry, and the profession. This Board would not function as a government regulatory agency but as a private group that would be empowered to call to account either party for any infringement of the stated principles, resorting when necessary to public comment in the mass media. The freedom of each group to pursue its endeavor could be guaranteed by this continuous and equal opportunity for confrontation of opinion and exercise of influence. The people could be reassured by periodic reports from this Board of Overseers. Here again the Association of American Medical Colleges and the Pharmaceutical Manufacturers Association could cooperate in developing such a plan.

To the people.—In the final analysis, the people of a democratic society have the power to take things into their own hands. If any enterprise threatens the welfare of the public, especially in matters of health, a brisk reaction can be expected. No good will come from encouraging eager politicians to seize upon health enterprises as a ladder to power. The people should not lean too heavily on bureaucratic governmental regulation,

for there is no substitute for high ideals in the development of sound practices in a free society.

Should it appear that unduly large resources have drifted into the possession of industry for the purposes of promotion, the structure of taxation may well be critically examined. It is not inconceivable that a plan could be devised that would limit the sums which can be charged to promotion in the cost of marketing drug products, thereby shrinking the size of the web the promoter could fabricate for his clients and freeing the profession from the threat of entanglement or undue influence from pharmaceutical "education."

The people do need some assurance of responsible behavior from those to whom they have assigned the rights and privileges of serving their health needs. This can only be obtained by insisting upon some arrangement for continuous public accountability from the profession and the drug industry, such as the Board of Overseers suggested in the preceding section of these proposals.

PRESERVATION OF FREEDOM FOR ALL

Censorship is justifiably condemned in a free society, and the mass media should be open to free and equal use by all responsible persons. Restraint through higher criticism is not to be confused with censorship—on the contrary, it should be liberally applied in every field of endeavor to encourage excellence and good taste.

The mood of the times must be changed from a squeamish feeling that open criticism is "negative" to a more wholesome regard for pointed public comment and public accountability. There is no more effective way to discourage artful attempts to enlist physicians in the sale of drugs by disguising promotion as "education" and to prevent misuse of the mass media by selfish interests rather than for the welfare of everyone.

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The Pharmaceutical Industry

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This statement has been prepared in response to an invitation from *The Journal of Medical Education*. There are a number of questions and problems of mutual interest to teaching members of the medical profession and the pharmaceutical industry, and, since lack of understanding and confusion apparently have contributed to the questions, the authors of this article have attempted to bring together some explanations and comments that concern areas about which there seems to be the most misunderstanding. Perhaps some historical background will be helpful.

The Pharmaceutical Manufacturers Association (P.M.A.) is the successor to two predecessor organizations, the American Pharmaceutical Manufacturers' Association, started in 1910, and the American Drug Manufacturers Association, which began in 1913. It was created in 1958 and has 140 members, each of whom is involved primarily in the manufacture of products for prescription use and who collectively make up more than 90 per cent of the total volume of pre-

scription products in this country. It has a comparatively large board of directors (27 members) and a president who is a physician and who for years worked closely with medical organizations, medical teachers, and researchers. The P.M.A. in addition has about 80 committees and subcommittees, more than half of which are involved in scientific interests ranging from blood dyscrasias to research control procedures for laboratories. The membership of these committees consists, of course, of scientifically and professionally trained people who are associated with the Member Firms. One very important aspect of the work of the P.M.A., which incidentally is in part a trade association and in part a professional association, is the avoidance of any act which would be considered illegal. The courts today are keenly watchful for any sign of an activity which might be in violation of a law, for example, in restraint of trade.

SEEKING ADVICE

About 2 years before the P.M.A. was born two representatives from the A.D.M.A. and two from the A.P.M.A. met with four representatives from the American Medical Association to discuss subjects of mutual interest to physicians and pharmaceutical firms. Other meetings subsequently were held. This liaison effort continued after the birth of the P.M.A. and led to the creation of a special committee of the Board of Directors. It is known as the Professional Relations Committee, and its members for 1960-

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1961 are the authors of the present report. Since its creation this standing committee has met on several occasions with representatives of the American Medical Association, with the Association of American Medical Colleges, and twice with the New York Academy of Medicine. Other meetings will be held with these bodies and with other medical and professional groups as time permits and as such meetings can be scheduled. In fact, P.M.A. officers are now meeting informally with others in preparation for such meetings. Always dominant in the discussions have been attempts to ferret out problems of mutual interest with a view to determining how these can be resolved. Two examples of the results of such probing may be of interest to the readers of this article.

One of the suggestions offered by the A.P.M.A. and A.D.M.A. representatives to the A.M.A. called for a detailed depth study of the attitudes of physicians toward the pharmaceutical industry. Truly desired was some knowledge obtained from an independent source so that likes, dislikes, suggestions, and areas needing clarification could be set forth. The A.M.A. unhesitatingly sponsored such a study independent of the industry, and when completed the study was turned over to the industry without restriction. Whereas many surveys have been made independently of and also by pharmaceutical firms, the A.M.A. study contained invaluable information for review and guidance.

Another example of the value of this exchange of ideas lies in the development of a set of guiding principles by the A.A.M.C. and P.M.A. In substance these principles are concerned with surveys of medical students, non-educational entertainment, awards and prizes, lectures, visits to pharmaceutical laboratories, printed literature, and drug specimens. Their usefulness and the spirit behind

their development are evident in a report rendered before the A.A.M.C. assembly at its recent meeting. To quote in part from this report: "After a year's experience . . . although there have been instances where both schools and industry have acted to the contrary, the committee feels that much progress has been made in relieving the problems toward which it is directed."

As these and other meetings have progressed it has been apparent that there is much confusion about what the primary objectives of the pharmaceutical industry are, what its association, the P.M.A., is organized to do, what the laws provide for marketing drugs, and how it is attempting to meet its obligations as part of the medical care team and as a responsible component part of good citizenship. While the industry has been seeking advice and has been sharing the results of its efforts, and while numerous organizations and many individuals have offered cooperation and at the same time sought information about the industry's way of life, there have been others, unfortunately, who have written and spoken apparently without the benefit of this knowledge. Some of the seemingly less well known facts are important, though, to educator, practitioner, student, researcher, and, for that matter, citizen. In view of the fact that the pharmaceutical industry is probably one of the most, if not the most, regulated industries in the U.S.A., the sharing of some pertinent information may be helpful to the *Journal* readers.

ADVERTISING

Perhaps the most misunderstood industry activity is its advertising. There are some not associated with the industry who seem to confuse promotional efforts with educational efforts, whereas actually the members of the P.M.A. do not consider their advertising to be educational but merely informative. Promotion ob-

viously is important for sales and the lowering in cost that usually is associated with volume production. Advertising of drugs is intended to arouse the doctor's curiosity, to acquaint him with new products or dosage forms or uses, and to encourage him to ask questions. It is not intended to urge the physician to act without adequate knowledge. Not only do the physician and his patient suffer, but the firm behind the product involved suffers when drugs are used improperly.

Sometimes there is confusion, so it seems, about how advertising claims are developed and censored. Of course, claims are based on the evidence developed by researchers, most of whom are in some way identified with academic circles. At times researchers do differ in their appraisals, but if the work of one man is more sound than that of another the fact usually is apparent. The evidence then is submitted as part of what is known as a "new drug application" which is presented to the Food and Drug Administration before a new drug can be placed in interstate commerce. Included in this presentation is what is commonly called an "official brochure"; it contains a description of the chemistry, pharmacology, and therapeutic usefulness of the drug. If adequate evidence is not available to support the claims, the F.D.A. says so. Incidentally, this brochure is available on request for physicians, pharmacists, and others who have a right to such information. If a new claim subsequently is to be advanced the new drug application is supposed to be amended before the claim is made in future labeling.

Advertising copy is based on the claims permitted in the "official brochure." Members of the P.M.A. subscribe to a belief that such copy should be reviewed by a medical department or consultant physicians. In fact, this is set forth in the statement of principles of ethical drug promotion adopted by the

P.M.A. in 1958. Contrary to the statements made by a few critics during the past months this is a common practice. In addition, advertisements prepared for medical journals are reviewed by offices or committees organized by the journals for this very purpose. Outstanding examples are the journals published by the American Medical Association and the state medical journals. Others could be mentioned if space permitted. Obviously there are times when not all readers of a journal may agree with all the statements in the advertisements any more than they will agree with all the statements in the scientific papers of the journal, but this represents difference in judgment rather than preplanned deception. Certainly an advertiser cannot "buy" his way into such reputable journals even if he were so inclined. Editors are well chosen in general and have important and informed men advising them constantly. If such were not the case the parent medical organization of an offending journal would soon bend to the complaints and wishes of its members. In fact, members of medical journalism meet frequently to discuss methods of improving communication with their readers.

Often one hears "there is too much advertising." Perhaps this is true, but what is too much? The advertiser knows when the return does not justify the expenditure for promotion, but neither he nor those responsible for a medical journal know when an advertisement has eased suffering, or even saved a life, because a reader was reminded of the availability of a drug or dosage form as he contemplated the handling of a seriously ill patient. No doctor reads all advertisements, only those that interest or appeal to him. Some direct mail pieces likewise may not be necessary; which of these are expendable might be difficult to judge at times. The best judgment fol-

lows the act occasionally. This hindsight is based sometimes on sales response but more importantly on the expressed opinions of men and women in medical practice. Few firms are foolish enough to ignore what seems to be the opinion of the majority; in fact, the members of the P.M.A. are very sensitive even to the justified individual complaint. The amount of color, the artistic approach, the shape of a mailing piece likewise may provoke comment, but again one must ask "what is too much" when human suffering, majority opinions, and the normal competition of a free enterprise system are influencing factors. Dignity, common sense, professional acceptance, and business judgment have a way of exerting a leveling influence in time.

Sometimes questions are raised about the cost of advertising. During hearings held recently by the U.S. Senate Subcommittee on Antitrust and Monopoly much helpful information was released on how little, comparatively speaking, is spent on advertising when one considers that the drug business is, after all, a business. Advertising costs are not necessarily written into the selling price of a product. Very often one cannot judge in advance, when the selling price is determined, how much promotional effort will be necessary to create professional awareness of the product. In such instances the money for promotion is taken, as a figure of speech, from a common account to be repaid if and when the product achieves some degree of professional acceptance. It is volume which is dependent on physician acceptance, not individual unit price that builds a reserve for the future, pays for new laboratories and machinery, underwrites research, and pays for dividends. Furthermore, volume lowers prices, or at least when minor items are involved, holds price advances in check while prices in other areas rise. Information in this

respect is available from several respected sources. Profit does not arise from exploitation of a customer but is a commission on good management.

MEDICAL NEEDS

Often one is asked if sales figures reflect promotional efforts or medical needs. Since it is the doctor who determines what a patient should have, sales figures should reflect medical needs. A physician does not have to use a new drug as soon as it appears, although he certainly should be informed of its availability. Obviously, he should not use it unless he is informed concerning its therapeutic indications, its limitations, and its side effects, if any. Since physicians are dependent on many sources for information, such as medical conferences, colleagues, medical journals, hospital conferences, and medical meetings, they are prone to ask "what is the need?" This is a proper conservative approach to be encouraged. The answer lies in part in the limitations of currently existing therapeutic applications and in part the seriousness of the disease, or sometimes symptom, under study. This is where the real role of drug therapy can be assessed. Some have said that this assessment is impossible to make. On the contrary, it is not impossible, although it may be difficult at times. The P.M.A., some of its member firms, and others are compiling a mass of information that will increasingly permit determining by decade, by disease, by working hours or most any other way what drugs specifically can do for those who are sick, for a community, for an army, even for an economy.

The purchase of a drug, like the performance of an operation, does not dilute or dissipate the purchase of medical care, since the consumer goes to a physician not for a drug or an operation but for a medical care package. Often, in fact, a drug or an operation, or a laboratory

test, or any other aspect of medical care is not specifically indicated for a visiting patient. One thing is foremost in the minds of all responsible people: The public should not be encouraged to tell the doctors how to operate, prescribe drugs, or apply rehabilitative measures; it is the doctor who should advise the public whether it be for choice of drug, or type of operation.

Since many members of the pharmaceutical industry are members of professional groups such as the A.M.A., A.A.M.C., A.C.S., A.A.G.P., and A.C.P., to mention only a few, there is a keen awareness in the industry of what should be the proper relationship between the public and members of the healing arts. How important this is, and will be, is evident from the increase in the volume of drugs sold. While a few might argue that this is due to the tempo of promotional tunes, actually it is directly related, of course, to more influential factors such as increasing population, more money and insurance plan coverage, more hospitalization, and more effective drugs. Prominent in such increasing volume are the large purchases by hospitals, through welfare departments, by the armed forces, and other bodies. Such increase cannot be charged fairly to wastefulness by physicians. Perhaps another way of looking at it is to compare the percentage of the medical care dollar spent for drugs today with that for 20 years ago; the percentage is no greater today. In fact, it is less. Or another way would be to look at the average prescription price: 60 per cent cost \$3.00 or less, and about 1 per cent costs \$10.00 or more.

TRADE NAMES AND GENERIC NAMES

The basic law regarding trademarks provides that "The protection given by law to trademarks has a twofold object, that is to protect the owner in his property, and to protect the public from being

deceived by reason of a misleading claim that the article bearing the trademark is the article manufactured by the owner of the trademark, when in fact it is not, but a substitute." Thus, protection for the trademark owner and for the public is a basic concept in our system of trademark law. This applies to all industries and is a fundamental principle of our American system.

Some critical comments made recently tend to imply that members of the P.M.A. are opposed to the use of generic names. Nothing could be more in error, since many of these members make available generically named as well as trademarked preparations. They are, however, opposed to the compulsory use of only generic names, just as educators would be opposed to being compelled to become part of certain academic staffs rather than have the privilege of applying to the schools of their choice. In the same way, practicing physicians would resent being located geographically by law or studying a certain specialty by decree or to being called simply the "X-clinic doctor" or the "1931 Vine Street Doctor." Furthermore, members of the industry as promptly as possible adopt generic names for simultaneous use with their trademarks. Not only is this desirable medically, but it is good business since it helps prevent a trademark from becoming the common or usual name and hence public property.

Manufacturers of original products requiring careful laboratory control have an investment in their preparations and believe they are entitled to a fair return on this investment in keeping with the traditional free enterprise system of this country. That this return is not unreasonable is indicated by the fact the average net profit for the industry is approximately 12 per cent.

Some seem to believe that the mere adding of a trademark

automatically increases the cost. This is not so any more than does the adding of the name "Chevrolet" automatically increase the cost of a car. In each instance the name is an indication of the owner's being willing to stand behind the product whether it be because of clinical research, chemical controls, or some pharmaceutical elegance or manufacturing process. This is important, as was pointed out by a former Medical Director of the Food and Drug Administration, who said "The naive belief that if a product was not good, the F.D.A. would prohibit its sale is just not realistic. F.D.A. labors long and diligently to protect the public but the fact of the matter is that it is completely impossible for F.D.A. to check every batch of every product of every manufacturer that is marketed. Hence the integrity and reputation of the manufacturer assumes unusual significance where drugs and health products are concerned." The P.M.A., incidentally, has urged repeatedly the allocation of sufficient funds for the F.D.A. to be staffed adequately in terms of numbers and expertise.

Some members of the P.M.A. are large and some are small but all, regardless of size, are confronted with requirements featuring laboratory control precautions and active research programs when they apply for membership. There are more than 1000 manufacturers in the U.S.A. but fewer than 200 are members of the P.M.A., even though the latter are responsible for more than 90 per cent of the prescription drug volume in this country. In view of the emphasis placed by many firms on the consumer protection implied in the use of tradename preparations, an article in the June 17, 1960, issue of *Science* (p. 1794) is significant. It reports that the F.D.A. took action only 4 times in 10 years against the 28 largest firms producing 87 per cent of the nation's drugs, as compared

with 484 actions against smaller firms producing the remaining 13 per cent; and many firms were never visited by the F.D.A. because of lack of staff.

Also of interest is the fact that one firm mentioned favorably by a "pro-compulsory-generic name" member of the Senate Subcommittee on Antitrust and Monopoly during recent hearings on the drug industry was cited subsequently for selling misbranded drugs. Another firm featuring generic names and allegedly lower drug costs was indicted for false advertising implying it had its own control system, whereas actually it did not—its claims being based on the systems of its suppliers. Still another firm made headlines recently because of the filthy conditions by which it operated. None of these firms are members of the P.M.A.

USE OF MEDICAL LITERATURE

From time to time one hears criticism that seems to be based on a few examples rather than a common practice. Sometimes, too, examples of breaches of good conduct are mentioned in a generally condemnatory way when actually these acts also are abhorred by the nonviolators. One example is the use of scientific papers without the permission of the authors and the editors. Common courtesy requires such permission; so does the copyright law. It is hoped that members of the P.M.A. are not guilty of this violation. In the same vein, there is no adequate excuse for deliberately taking something out of context, and this is frowned on by all responsible members of the industry. There are times when differences of opinion arise over the significance of a sentence or paragraph just as occurs when one writes a textbook; but this is not intended as an excuse for deliberate deception.

Occasionally questions are asked concerning the advisability of referring to unpublished material. If such material

is completely informative, it should be made available to inquiring physicians in view of the long delays in publication. This, after all, is the type of information on which the Food and Drug Administration considers a new drug application. If the research is adequate and it is available in the literature or on request, it is important that the physician who is interested learn about new therapeutic measures as soon as possible. What subsequently is published in the literature is for the editors and their editorial boards to decide. They make the choice on the basis of their judgment concerning the needs and wishes of the readers of their journals. Not infrequently this is determined as a result of carefully planned studies and surveys. Since no one assumes the practicing physician will read all of the literature, it is not surprising to learn that studies clearly reveal which doctors read which journals. This self-limitation is consistent with freedom of choice, and its importance becomes evident particularly in groups sufficiently well educated to make intelligent choices.

FINANCIAL SUPPORT OF EDUCATION

Reference has been made occasionally to the support given by the pharmaceutical industry to medical schools. Usually there is reference only to the money that is donated to the National Fund for Medical Education. Actually, the industry contributes much more through additional channels. Furthermore, it has many demands made on it in other educational and research areas. According to a survey made for 1959, the breakdown was as follows:

Total unrestricted grants, etc., to medical schools	\$3,600,000.00
Grants to institutions sup- portive to schools in medicine and related sci- ence	2,500,000.00

Other grants or contracts for medical research and development in medical schools and other academic institutions	8,800,000.00
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Total: \$14,900,000.00

Firms make contributions to capital expansion programs of colleges and universities, unrestricted research grants to colleges and universities, contributions for undergraduate scholarships such as the National Merit Scholarship program, unrestricted grants for postgraduate training and research, and contributions to foundations and other philanthropic bodies, to mention only a few areas of activity.

SOME OTHER QUESTIONS

The pharmaceutical industry is not without fault. It is composed of human beings who can make errors in judgment just as can occur in all industries and professions. However, the members are trying to seek some of the best medical, legal, engineering, and other talent that is available, and it is continually seeking the advice of others and of their organizations. When its own employees err, check reins are put on these miscreants when the facts so justify. Unfortunately, though, progress is more difficult when misstatements of fact are made. Rhetorical questions based on false assumptions can be hurtful, but plain misstatements exert harmful effects reaching far beyond the target.

Sometimes reference is made to an alleged increasing interest on the part of the prescription drug industry to expand into the "over-the-counter" area. The facts do not support a charge of selfish broadening interest in this respect. A review of the records for the years 1955 through 1959 would reveal that few products are being transferred from prescription to "over-the-counter" category in recent years. In 1955 there were eight,

in 1956, 1957, and 1958 there were five in each year, and in 1959 there were three. In fact, in 1959 only two appeared on the market, since the manufacturer of one did not make this preparation available because of the possibility of drowsiness. In regard to this general problem, incidentally, one very important item should not be overlooked: The Food and Drug Administration as it interprets the Federal Food, Drug and Cosmetic Act gives the manufacturers no choice. Under the Durham-Humphrey Amendment of 1952 products that can be classified as safe for sale without a prescription must be so labeled. This is why manufacturers formerly desirous of promoting drugs only on a prescription basis are obliged to relabel certain products for over-the-counter sale. This change came about by law, not through a decision of the pharmaceutical industry.

Not infrequently one hears the comment "there are too many brands of the same drug." Since the free enterprise system permits multiplicity of cars, shirts, physical devices, contractors, doctors, and medical schools one is inclined to ask why this accusation is raised only for drugs. Physicians are not expected to learn how to use all drugs or become familiar with all brands. He should, however, be given the right to choose the product he thinks is best for a given patient and have the right to choose the brand in which he has confidence. Doctors have preferences usually self-generated, not always inspired by advertisers. The free enterprise system encourages multiplicity of brands, but the check rein lies in poor research, poor control, and continued deception which lead to loss of confidence and in turn to a diminution of the number of brands. Something not generally realized, perhaps, is that manufacturers cannot collude to divide the market any more than they can agree to

set prices. Such acts are illegal. Furthermore, whereas many products are suggested by physicians, still other brands are requested because those making the requests have faith in certain firms to which they direct the requests.

In connection with the multiplicity of brands one should not overlook the development of special dosage forms, or even the use of special fillers which may permit long periods of storage, prevent chemical interaction and breakdown of active ingredients, or lessen irritation. Since not all physicians have laboratories for controlled drug studies at their disposal or see all of their patients in hospitals, such problems can be important. Even seemingly slight modifications in the chemical structure can lessen toxicity or increase effectiveness. Not infrequently these modifications follow suggestions by men in medical practice as well as those in the laboratories. One of the exciting aspects of drug production is this interchange of ideas, suggestions, and criticism. So many are involved, and yet all have the same objective—the best possible medical care.

Some ask "why not let the government determine the number of brands and prices?" Do the people raising such a question really want this? If so, they can look forward to government control over their own income and the kind of training they can obtain or the books they can write. This country was founded on a desire for freedom, and it owes its greatness to a continuation of this freedom. The answer to some of the problems confronting us today lies not in a loss of this freedom but in an extension of education and facilities for the educated to utilize, including choice of products in the medical care field. Many medical organizations are seriously studying the challenges confronting them and their members, and already the American Medical Association has announced its

intention of greatly expanding its efforts in this respect. The activities and hopes of other bodies are evident from a study of their programs.

CONCLUSION

There always are differences of opinion in any professional or business area, but as long as there is a mechanism to discuss and resolve these differences progress is made. In the medical care field such resolution is especially important, since it, more than any other area, currently is the subject of emotional and political pursuit, speculation, and comment. Moreover, this will continue to be so for the

immediately foreseeable future. It behooves all of us, then, to be certain of the facts when we engage in discussion, and it is equally important for all of us to defend that which is inherently right. When there is room for improvement the necessary change can best be effected by discussing the problems within the confines of the interested parties. Public airing of issues which can only cause confusion at best, and which themselves may arise because of lack of familiarity by the critics with the facts, will in the long run be harmful to those whose objective is the prevention of illness and the care and rehabilitation of the sick.

A Proposal for a National Academy of Continuing Medical Education

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If the preceding articles are read with the care they deserve, one cannot help but become aware of increasing turbulence between the medical profession and the pharmaceutical industry. Also, one cannot help but be made aware of the fact that the health and welfare of the nation are completely dependent upon harmony between these two groups—a harmony that unavoidably must come out of a situation in which the proper function of one depends upon the other. If this dependency is to reflect the strength that it should, both the profession and the industry must pause, identify the denominators that are common to both sides of the problem, and then work together in shouldering their responsibilities and moving toward their goals.

As we attempt this approach from the standpoint of the medical profession, it is natural that we look first to the manner of its education, particularly that portion that must extend throughout the period of responsible professional life. How adequate are the educational processes by which a practicing physician can maintain scientific understanding, critical judgment, and professional competence against the erosion of time, advance of knowledge, and pressures from the body politic? And the corollary: How concerned with the answer are the practitioner, teacher, and investigator?

It should not be necessary to make a case for the importance of continuing educational opportunities to the practicing physician. But since the pressures of time and work are progressively widening the gap between the practitioner on

the one hand and scientific research and development on the other, it is apparent that this must be done and corrective steps taken. Medical progress must not be allowed to outdistance the scientific and professional competence with which the physician helps his community. This matter is at once the concern of the practicing physician, the medical teacher, and the scientist.

Until fifty years ago, more or less, clinical practice provided the grist and impetus for medical education and research. The practicing physician refined the observations, experiments, and conclusions for studies which laggard academic institutions slowly embraced. Medical schools went only so far; the critical educational and research processes were found in practice. Now the situation has changed. Practitioners are hard-pressed to remain abreast of the accelerating expansion of medical-scientific knowledge. An inspired and vigorous body of teachers and investigators steadily alters the concepts upon which professional practice is based. The practitioner, his scientific perception gradually blurred by time and his educational diet stinted by geography and distractions, is engaged in a difficult struggle. He wants to conduct his professional practice on a basis of current scientific development and medical theory, but has no practical, efficient, or easily accessible educational opportunity to aid him. Medical knowledge is not static; it changes and progresses. The medical schools themselves have difficulty maintaining undergraduate programs which embrace the

implications of increasing scientific activity. But the practitioner, faced with the demands of his community and the individual problems of his patients, is left to inadequate devices for obtaining, evaluating, and adapting new knowledge—let alone contributing to it.

Of course, remedial efforts have been made. National, regional and local professional groups, as well as hospital staffs and medical schools, publish journals, arrange symposia and meetings, support lectures and offer courses in various subjects. Government, voluntary health agencies, and commercial concerns provide special programs and publications. But none of these represent an integrated educational program of uniformly high standard—comprehensive, objective, and pertinent to the sophisticated needs of the practitioner.

Two or three decades ago, medical journals, scientific meetings, and societies were reasonably adequate, logically, to professional requirements in the adaptation of new knowledge. Formal postgraduate programs in some medical schools and the expansion of the residency system supported the practitioner's continuing competence. However, these measures gradually fell behind the mounting educational requirements of the practicing physician and the forces with which he had to cope. New elements rose to become powerful forces in medical practice. Science was providing medicine with new knowledge, new and specific therapeutic agents, and new scientific methods of an increasingly complex nature.

For society to benefit from this progress, extensive industrial support was required on an increasing scale. Industry seized an opportunity and met a need. Large industrial empires came to depend upon the physician for their existence. Business competition was inevitable and keen; it is growing progressively more

keen. And in this atmosphere, with the elements for confusion abounding in his journals, in his mail, and on his radio—and now with commercial "medical" television about to add its voice and sights to the mélée—the practicing physician finds that critical discernment within the limits of his available time and energy is well nigh impossible. More and more the physician is being asked to apply measures prescribed for him rather than those determined by him.

If we are realistic we will concede that these pressures are not likely to recede. They can probably be reduced and put in perspective only by measures so high in principle and resolute in purpose that few, if any, pressure sources can find the timeliness or basis for challenging them. The medical profession itself must take the initiative and develop educational processes which will surmount, even utilize, the pressures which presently confuse it. A challenge is posed for educational pioneering and innovation of a kind never before attempted. Casual methods, superficial and patronizing instruction, or discursive filibustering can have no place in an effective effort of this kind.

The need is for: First, educational enterprise in the real sense of the term—continuing comprehensive educational programs which effectively interpret the changing body of medical knowledge in a manner appropriate for mature members of a learned profession; second, a method of transmission or delivery which meets the practical considerations of the physician's everyday situation; and third, an effort that is protected against exploitation from any quarter. If the need cannot be met in these ways, the gap between accumulating knowledge and the practitioner's ability to use it will certainly increase.

With these thoughts and situations in

mind, this presentation is made to propose the establishment of a "National Academy on Continuing Medical Education." The educational requirements of the practicing physician would be placed in the hands of perceptive, academically-free physician-scientists whose experience, abilities, and dedication would constantly serve the objectives of the Academy. It should not be difficult to enlist the imagination and perspective of administrative medical educators, the wisdom and experience of outstanding practitioners, and the teaching skill of distinguished medical scientists in the development of definitive programs of interest and value to the practitioner. The Academy, provided with a full-time administrative faculty drawn from individuals of such caliber, would assume the direct educational responsibilities. Operating under wise, statesmanlike policies, established by a board of regents or governors who would be carefully chosen representatives of the major professional societies and the Association of American Medical Colleges, the Academy could satisfy the first and third requirements of continuing medical education.

The second requirement, effective, convenient transmission and delivery, could be met superbly by well-tested motion picture, television, and radio educational techniques and facilities. Higher education has made most effective use of these methods of transmitting information. Their usefulness in continuing medical education should be limited only by the interest of the profession, the competence of instruction and the relevance of program. It is proposed, therefore, that the motion picture, television, and radio be the principal teaching media to be considered by the Academy. Around these media can be developed all the printed supplements, and the two-way telephone and mail question and answer methods that have contributed so much to the suc-

cess of education in other fields. Certainly, if television is to develop as a major instrument in continuing medical education, particularly if either the open or the closed circuit is to play a role, it should be only under the aegis of a national agency such as we are suggesting. This medium has gone beyond the "gadget" stage. Appreciation of its potential should not be obscured by the abuse to which it has been subjected commercially. Technical developments now on the horizon forecast its establishment as an educational tool which encompasses the blackboard and chalk and the slide and motion picture projector, and then ranges beyond to incorporate situations and teaching aids that may be geographically remote from each other. Presentations need not be limited by the environment of their origin. This medium is bound to stimulate better teaching, because the programs can be revised again and again with increasingly critical appraisal by the practicing physician.

With the assumption of the establishment of an Academy evolved from these considerations, bound to the principles of a university and operating with the philosophy of a graduate school, the following five points would be major elements in its effectiveness:

1. The origin and composition of the board of regents or governors, and their relation to the full-time administrative faculty and technical staff;
2. The composition, authority, and experience of the administrative faculty;
3. The composition and responsibilities of the supporting staff;
4. The composition, qualifications, and interest of the advisory committees;
5. The immediate and ultimate financial support of the Academy.

The Academy could bring together, on a corporate basis, all the major professional agencies logically concerned with the continuing education of this nation's

practicing physicians. The formation of a corporation would permit several agencies to do together what no one can do alone. The status, scope of opportunity, and freedom of action necessary to an effective performance would be assured. Both the precedent and the advantages for the suggested corporate method of procedure have been set by the National Intern Matching Program and the Educational Council for Foreign Medical Graduates.

Carefully chosen representatives of the cooperating agencies would serve as the board of governors or regents. This board would have final authority and responsibility for a national program of continuing education under the charter of incorporation. The policies would reflect the considerations which led to the establishment of the Academy. The professional organizations most logically to be entrusted with this enterprise would be the American Medical Association, the American College of Surgeons, the American College of Physicians, the American Academy of General Practice, and the Association of American Medical Colleges. The Executive Council has already indicated the willingness of the A.A.M.C. to join with other agencies in the consideration of a national approach to continuing medical education as an enterprise of major importance. Conceivably, certain other organizations might be represented. The criterion for representation would be the exclusiveness of interest in the professional and scientific competence of the medical practitioner. Representatives of these organizations would become the incorporators of the Academy and its first board of governors or regents. Their selection, terms of office, and replacement would be prescribed in the by-laws of the Academy. To this board would be responsible, through a chief administrative officer, the administrative faculty, officers, committees, and

employees of the Academy. The board in turn would be responsible to its constituent organizations under terms stipulated in the charter. The members of the board probably would serve without compensation except for expenses incurred.

The administrative faculty of the Academy might have a departmental organization somewhat like that of a school of medicine with appropriate modifications. It would be the full-time professional staff of the Academy and have its chief administrative officer a president and dean. This faculty would not necessarily participate directly as instructors or lecturers in the program of the Academy. Its role would be the selection and development of subjects, the formulation of integrated long-range programs, the choice of the most able lecturers, demonstrators, and panel members for the programs. The faculty would develop the staff and methods for studying the interests and requirements of practicing physicians, determine the extent to which these were being satisfied, and adjust the course content, methods, study guides, résumés, compendia, and correspondence accordingly. It would be essential that the staging of each program stimulate as well as maintain interest, set a pace, and provide clarity which would leave no doubt in the practitioner's mind that he had gained a real dividend from his investment of time and effort.

Obviously, financial support of the proposed Academy would have to be substantial. For the early phases of development, funds should be supplied by the professional agencies represented. This would guarantee maximum independence during the all important conceptual and planning period. Later, with actual preparation for the first series of programs well under way, a strong case for support would be ready for presentation to private foundations and voluntary health agencies. Industrial support could also

be considered if it came without strings. It is not unlikely that grants-in-aid could be obtained from various bureaus of the U.S. Department of Health, Education, and Welfare. The Academy's educational service to the individual practicing physician and his local hospital, society, and voluntary health groups should attract major sources of support. We submit that the hospital staff would present the most logical single focal point for the Academy's effort. Staff meeting attendance is required. Much of the staff activity involves the presentation of actual cases. The Academy's programs could, therefore, serve as important points of reference which, particularly with the Academy's carefully prepared compendia at hand, could add much to discussion. And if this could be supplemented by two-way telephone or radio, a "faculty" visitor or even correspondence, the value of staff meetings would be correspondingly enhanced.

Establishment of a "National Academy of Continuing Medical Education" would lose much of its effectiveness if it were to compete with or replace existing physician-controlled mechanisms for practitioner education. The proposed Academy should function with a graduate school philosophy of high level scientific and professional education. It would provide integration, continuity, and constant revision of basic scientific and professional concepts. Its mission would be to fill a void rather than replace a process; to provide a focus and reinforce the special efforts of local, regional, and national professional groups. Should this materialize, it would serve as an important liaison point with the educational activities of professional medical organizations, hospitals, and postgraduate divisions of medical schools. It should serve to strengthen and make better use of the postgraduate work being offered in many of our leading teaching medical

centers. Some of the excellent postgraduate courses given by these centers might actually provide programs of the Academy. Programs from "on location" could bring a very necessary realism and immediacy to appropriate spots in its program schedules.

The United States Public Health Service, through its National Institutes of Health, is beginning to provide total support for clinical research institutes. This will make possible a great deal more research—and improved research—in the clinical usage of drugs, which in turn will greatly augment our already vast store of this kind of knowledge. Difficulty in the transmission of this knowledge to the practicing profession will correspondingly increase. This proposal suggests a mechanism that can handle this development in adequate stride, free of much of the stress and strain of the competitive situation that presently pertains. Standardization of terminology and standards of accuracy would be developed which would serve all levels of educational activity in medicine and all forms of promotion in industry.

As far as continuing postgraduate medical education is concerned, we feel that the present gap between what is needed and what is being done is comparable to the situation that pertained in undergraduate medical education in the early 1900's. The sooner a forthright over-all approach to the problem is made, the better. Of course, the expense of such a proposed non-profit corporation would be considerable. But with the knowledge important to medicine increasing by leaps and bounds and with medicine's potential effectiveness increasing correspondingly, any program that will enhance the practicing physician's competence in the prevention and management of illness is a sound investment, no matter what the cost.

Pediatric Education Around the World

Report of a Special Session at the IX International Congress of Pediatrics,
Montreal, Canada, July 25, 1959*

Taking advantage of the presence of a great many teachers of pediatrics at the IX International Congress of Pediatrics in Montreal, P.Q., Canada, in 1959, a special post-Congress session on pediatric education was organized by the World Health Organization in cooperation with the International Pediatric Association. Two panels, composed of professors from various countries of the world, each introduced key problems regarding the teaching of pediatrics—the first in regard to all students of medicine and the second regarding the preparation of pediatric specialists and pediatric teachers. General discussion among the approximately 300-400 participants followed.

In opening the meeting, Dr. Alan Ross, Professor of Pediatrics at McGill University (Canada) and President of the IX International Congress of Pediatrics, emphasized the wide differences in pediatric teaching around the world; a survey in Latin America revealed a variation in pediatric teaching hours from 80 hours in one school to 740 in another. He noted that the Report of the WHO Study Group on Pediatric Education, which met in Stockholm in 1956, had been widely distributed, as had the reports of surveys of pediatric education in Canada, the U.S.A., Europe, Australia, New Zealand, and Latin America. Exchange of ideas based upon factual data and upon individual experiences would be mutually advantageous.

TEACHING OF PEDIATRICS TO ALL MEDICAL STUDENTS

Dr. Joseph Stokes, Professor of Pediatrics at the University of Pennsylvania

* Abstracted from the verbatim recording,
by Dr. M. E. Wegman.

(U.S.A.), moderator of the first panel, introduced the other five panel members: Drs. Ariztia, Brokman, de Silva, Gharib, and Vahlquist. He noted that the broad purpose of pediatric teaching was to play its role in the preparation of good general physicians able to serve the community as well as the individual. He then asked the panel to discuss how existing conditions and needs of a country, as well as its medical problems, influence what is taught about pediatrics to all students and what emphasis should be given to subjects such as public health and growth and development.

Dr. C. C. de Silva, Professor of Pediatrics at the University of Ceylon, said that the doctor in a district hospital in his country finds that approximately half, to be conservative, of his patients are children and that the vast majority of the diseases are preventable. Two-thirds of the patients are suffering from conditions like malnutrition, diarrhea, intestinal parasites, and respiratory infections. In addition, the newborns are small—one in three babies is below 2,500 gm.—which usually means low vitality. Various factors are responsible, such as poverty, ignorance, bad housing, overcrowding, due to too many children being born too frequently. Obviously, there must be much closer liaison between the departments of pediatrics and public health in these countries. During the medical course further emphasis must be placed both on the time and the manner of presentation of the problems of nutrition and malnutrition and on their influence on growth and development. Infant feeding and preschool feeding should take high priority in any teaching pro-

gram. This is best done in clinics, in wards, and, most important of all, in the homes of the children. The departments both of pediatrics and of public health must cooperate in this home-visiting program, in collaboration with public health authorities, using a home care service to the greatest extent possible. The influence of the health and diet of the mother—before, during, and after pregnancy—on the growth and development of the child should be emphasized. Dr. de Silva concluded by saying he would like to see some organization, such as WHO, organize a circulating library of teaching films and stimulate needed new films.

Dr. Mohammad Gharib, Professor of Pediatrics at the National University of Teheran (Iran), noted that in his country, too, the chief problems, following the high mortality of the neonatal period, were related to very high prevalence of infectious disease and malnutrition. He believed that medical education, as well as public health programs, should concentrate on these phases, particularly with reference to communities and hospitals far from university centers. Unfortunately, there is still a great deal of such diseases as tuberculosis, diphtheria, and tetanus which, in so many countries, have essentially disappeared. Medical students need to know more about the influence of customs and habits on nutrition. He mentioned a collateral problem in medical education—the large number of students who wish to enter medical school, a number far beyond the capacity of the schools and the hospitals. Since more physicians are needed in his country, the government is trying to increase the capacity of the schools and the number of hospital beds. Emphasis should also be given to instruction on effective immunizing procedures, giving due recognition to the need to teach avoidance of excessive reliance on injections, which are so sought

after by people with little knowledge about health.

Dr. Bo Vahlquist, Professor of Pediatrics at the University of Uppsala (Sweden), commented that it would be appropriate to say a few words about the very specific problems of a country of another type, like Sweden. As in many other Western countries, preventable diseases, if not eradicated, are only a minor problem. Vitamin deficiencies are practically nonexistent. Of greatest importance in Sweden is emphasis during the undergraduate teaching in pediatrics on mental and behavior problems. These are growing in importance not only relatively but also, it seems, absolutely. Child psychiatry is developing, but there is still a great need for pediatricians and general practitioners to know much more about these problems, especially at early ages.

Dr. S. T. Achar, Professor of Pediatrics, University of Madras (India), added that undergraduate pediatric education in his country must face the same sorts of problems mentioned by Dr. de Silva for Ceylon, notably with regard to infectious diseases and malnutrition. At the same time, knowledge of the fundamentals of pediatrics, such as growth and development, clinical and laboratory work-up of cases, and an understanding of the natural history of disease in children, must be ingrained into the undergraduates continuously from early in the clinical years, just as anywhere else in the world. The undergraduate must learn the practical importance of social and preventive aspects, through small demonstration units for certain phases, since it is not possible to cover the entire field. At present there are only a few pediatric teachers in each college in India. Often the professor is working on a part-time basis, with an assistant if he is lucky. Furthermore, he usually has a very heavy service load with a terribly

crowded out-patient department and a rapid turnover of in-patient admissions and discharges, all leading to a kind of assembly-line turnover which is not at all conducive to the making of a methodical physician. Most medical undergraduates in India pay scant attention to pediatrics during the undergraduate period because of the examination system, partly inherited from Britain (he hoped he was not offending his British friends here)—medicine, surgery, and midwifery, being the major clinical subjects for the passing of examinations, loom large on the horizon of the student. The genius of the teachers of pediatrics in the medical colleges in India must then consist in raising standards of undergraduate pediatric education, in giving students familiarity with the medical examination of children and with the all-too-common ailments of the community, at the same time avoiding exposure of the student to the atmosphere of rapid diagnosis in the out-patient and wards. Collaboration with other departments, especially that of preventive medicine, is an urgent necessity.

A difficulty peculiar to India is the change of instruction in the school system from English to the local language, although the teaching of sciences, including medicine, remains in English. This causes problems for the teachers and students. He thought that visual aids, such as good films as mentioned by Dr. de Silva, and exhibits have a big role to play.

Finally, he emphasized that educators need to be educated, but that in addition government and university authorities need to learn of the importance of better pediatric education. He did not know how much of what was being said at the Congress would reach them and feared that we were converting those already converted.

Dr. Florencio Escardó, Professor of Pediatrics at the University of Buenos

Aires (Argentina), said that in his country the child comes to the attention of the medical student in a sudden manner. Before the classes in pediatrics, no mention is made of infant diseases—not in physiology, not in pathology, not in physical diagnosis. Thus, when students come to pediatrics at the end of the curriculum, they need to be initiated into elementary concepts of pediatric physiopathology, anatomy, diagnosis—in short, everything. Curriculum changes are planned to connect pediatrics with physiology, pathology, and other subjects so that students will be thinking of children's problems from their first days in the school of medicine. Members of the pediatric staff are already presenting material in the pathology course, concentrating on the ten subjects which statistics show are the most significant causes of mortality in the country.

Dr. Vahlquist was then asked by the moderator how the pediatric course should be organized, how much emphasis should be given to practical work with patients, and how much emphasis on laboratory work. In reply he said that since it was impossible to cover in 5 minutes all points of view on this problem, he would outline the situation in Sweden. A recent major change in the medical curriculum has given more hours and more time to pediatrics than ever before, putting pediatrics second only to medicine and surgery in the clinical disciplines. Pediatrics is given as a block course in the next to the last year of clinical training, and the student spends his time in the hospital and works with the patients. The 4 months include child psychiatry and also a new and recently introduced topic, social and preventive medicine, a good combination from the pediatric standpoint. Two months' training in pediatrics is available as an elective in the last year. Not all students

take this, but it is expected more will in the future.

The importance of practical work and dealing with patients has been stressed in Sweden for many years. Since pediatrics comes rather late in the curriculum, the student has had experience in examining adult patients and is more mature in his approach to patients. Each student deals directly with between 20 and 30 patients in total, but in rotating from one department to the other has contact with many more. A weakness in the present system is that work in the outpatient department is not as extensive as the staff would like. This is the pediatricians' own fault, since they have lowered infectious diseases and deficiency diseases so much and have thus diminished out-patients! The paramount importance of continuous patient-doctor contact is stressed, and the student learns the methods of taking histories, examining children, and so forth. Students are not expected, at the end of the course, to be able to make a diagnosis immediately on Lutembacher syndrome, but they are expected to know how to examine a child properly and how a simple diagnosis should be made.

Finally, laboratory work is not stressed in the present scheme. Earlier in medical school, students have had special training in ordinary clinical laboratory work. During pediatrics some idea is given about simple procedures, how to take samples from children, and how to evaluate simple methods. The Swedish doctor, if he is not in a hospital, is not very much inclined to use laboratory work. On the other hand, a little more laboratory work than at present might be appropriate.

Dr. Henryk Brokman, Professor of Pediatrics at the Academy of Medicine, Warsaw (Poland), answered the questions "With what other subjects in the curriculum is correlated teaching with

pediatrics most important and what are the best methods to accomplish this correlated teaching?" by saying that the basis for pediatric teaching lies in the physiology course, which gives the departure point for knowledge of the principles of child development, including nutrition. Unfortunately, the general physiology course often fails to pay enough attention to the special aspects, physiological and psychological, of childhood. This is often also true of the specialized clinical fields such as neurology, psychiatry, surgery, otolaryngology, dermatology, and ophthalmology. To remedy this situation, one may use two methods, depending on local conditions. One is to create in the respective department a section on children's problems, directed, he emphasized, by a specialist who also has pediatric training. The other alternative is to integrate the specialized aspects in the pediatric department. It may be necessary, under certain local conditions, to combine the two systems. Emphasis has already been laid on the need to correlate pediatric teaching with preventive medicine and statistics.

Dr. Aníbal Ariztia, Professor of Pediatrics at the University of Chile, in answer to a question on how much use should be made of community services in the teaching of all medical students, noted that in Chile, for the teaching of pediatrics, a great deal of use is made of the different community services. Arrangements have been made between the University and the National Health Service, which runs all the hospitals, the health centers, and other services, to use them for teaching. In the Medical School of the University of Chile there are five pediatric departments, each with its own hospital service. In total, 740 hours are devoted to pediatrics. The teaching time is distributed between lectures and practice, the latter carried out in three broad groups: first, the students work in the

children's hospitals and children's departments of the general hospitals, newborn sections of maternity hospitals, outpatient departments, and well-baby clinics (each assistant on the teaching staff takes care of no more than four or five students); second, students are taken in groups to work in health centers (this type of practice is carried on in combination with the teachers of the Department of Public Health and Hygiene); third, some of the five departments put much emphasis on what is called teaching at the field level, or "enseignement au carré." For this purpose, the students are taken to industrial or workers' home areas where centers for ambulatory care function. At the same time, small groups of students are assigned family groups, with which they take responsibility for follow-up of the children, prevention of diseases through daily education of the family, vaccination, and so on. All this is done under the supervision of assistants of the teaching staff and with the aid of social workers of the National Health Service.

A corollary question is in what proportion to distribute the different types of activities. There is risk of overestimating the importance of the social aspect of medicine and underestimating the training and technical preparation of the student. On the other hand, pure clinical and laboratory techniques may be over-emphasized. A balanced program should be developed using community services to acquaint the student with the diseases which are the most common causes of morbidity and mortality. For the success of any balanced plan, it is necessary to have an adequate teaching staff. Perhaps one of the chief purposes of teaching through practice in the different community services is to teach the students to learn by themselves, through their own efforts, rather than passively receiving what is shown to them even with the

most modern equipment. The preventive and social aspects must be taught also in the public health and hygiene departments.

He strongly agreed with what Dr. Escardó had said about students coming to pediatrics without knowing anything about child development, physiology, nutrition, and so on. Thus, much time must be spent to teach these elementary fundamentals of physiology, nutrition, and so on. Even with as many hours as in Chile, 740 in a 6-year curriculum, it is difficult to train the students adequately when so many hours must be given to fundamentals.

Dr. Stokes, Moderator, said that Dr. Ariztia was to be congratulated for obtaining as many as 740 hours in the pediatric curriculum.

Dr. Stokes went on to introduce the question of what methods are useful in giving the general physician further training in pediatrics after he is in practice. To name a few, there are organized refresher courses for the practitioner coming back to the pediatric hospital or the pediatric service every year or so; regular weekly or monthly seminars on topics of current interest; bulletins distributed to the general practitioner at monthly or perhaps less frequent intervals, reporting on new methods and new studies; arrangements to bring patients to the hospital for discussion of particular cases, particularly appropriate and helpful in the field of psychological problems in pediatrics; family health services that bring to the practitioner the teachers from the medical schools. Not only is it possible for students to go into the home, but if they are also followed by the teacher he is able to carry the newer methods and developments in the field of pediatrics to the general practitioner.

Dr. James G. Hughes, Professor of Pediatrics, University of Tennessee

(U.S.A.), was asked to comment on "circuit riding" or "peripatetic pediatrics" as a teaching method. He answered that this consists in having an experienced pediatric teacher visit the doctors in a given area regularly over a period of months or years. Thus the physician receives regular instruction in his own home community, urban or rural. In any one town there might be 30-50 physicians taking the course on each day: Monday it would be given in one town, Tuesday in another town, Wednesday in another, and so on around the circuit, taking a total of about 10 weeks. The teacher does many things besides simply lecturing. He visits physicians' offices and their hospitals and helps diagnose cases. He talks to practitioners privately and gives a great deal of individual and personal instruction, which is most valuable. Other techniques include the use of closed circuit television and audiotape recordings.

Dr. Luis Torregrosa, Professor of Pediatrics at the National University of Mexico, stated that in reorganizing pediatric teaching for a pilot group at his school, pediatrics was presented as a branch of medical science which embraces study of the human being in growth and development. Naturally, social and preventive medical problems of this part of the life span were stressed. Plans were made for joint classes with the basic science professors—physiology, biology, anatomy, and others. After teaching history-taking and physical diagnosis in infants and children, a 2-month practical course of a little less than 300 hours tries to put the student up against the problems he will face as a practitioner in Mexico, where more than 50 per cent of the population is under 15. Great help in formulating this new program was obtained from the Survey on Pediatric Education carried out by the Pan American Health Organiza-

tion/World Health Organization. To carry out the new plan, it was necessary to train the teachers in modern techniques; fellowships are most useful. The job now is to extend this plan to the other schools of the country.

Dr. Ralph V. Platou, Professor of Pediatrics at Tulane University (U.S.A.), emphasized four points. First, for the greatest good of the greatest number of undergraduate medical students, the block system of teaching has evolved as the most satisfactory. Yet there are evils in the block system; the most conspicuous one is lack of continuity of teaching. This can be overcome by careful planning toward integration of teaching within and through blocks, particularly with obstetrics and with preventive medicine.

Second, with regard to central production and distribution of teaching aids, he personally decried central *production* but strongly supported central *distribution* of teaching aids prepared through local initiative. No one appreciates being told to do things in a certain way because others do. The same funds that might be used for central distribution or central production could better be used to encourage local efforts toward preparation of teaching aids. Teaching slides, in his experience, were much more useful than teaching films or movies.

Third, the proportion of medical students who will become specialists varies from school to school and country to country, but in his school some 65 per cent of undergraduate medical students are specialists 10 years or less after graduation. This has a very important bearing on the pattern of undergraduate teaching and emphasizes the need of a block system, which assures that all students will have had basic pediatrics whether they are to be pediatricians or surgeons or obstetricians or public health officers or whatever.

To meet the point made by Dr. Vahl-

quist on the importance of laboratory discipline at the undergraduate level, a thesis program, comparable to that necessary for the Ph.D. degree, might be incorporated in the medical curriculum. There are, of course, difficulties, but these grow less with experience. A thesis program assures that each of the undergraduate medical students will have had, through presentation of a satisfactory thesis based on his own research work, a considerable training in the disciplines of the research laboratory as opposed to the kind of laboratory work which all medical clerks do incident to care of their own assigned patients.

Fourth, in any curriculum there needs to be aggressive insinuation of pediatric teaching throughout every month of medical education, beginning with participation of pediatric staff members during the teaching of anatomy. There are many devices for accomplishing this but none better than personal acquaintance, personal contact, personal relationships with each of one's colleagues in each of the other disciplines one is concerned with. For example, in relation to poisonings and accidents, a leading cause of death in the United States, pediatrics participates actively while the students are studying basic pharmacology; later the pharmacologist takes part in teaching pediatrics.

Dr. Stokes, Moderator, emphasized the point Dr. Platou had made about student research. Through work perhaps with one of the members of the pediatric teaching staff, a student can develop enthusiasm for the growth of medical science and pediatrics, which helps him keep an interest in these fields through his medical career.

Dr. Elena Boder, Assistant Clinical Professor of Pediatrics, University of Southern California (U.S.A.), commented about the integration of community facilities into medical education,

noting that through use of schools for the handicapped one can demonstrate an interdisciplinary approach to the whole child. The material at such a school is drawn not only from one clinic but from all the clinics and hospitals in the city. Furthermore, contrary to a hospital or clinic setting, this has the material available on any day desired. The reaction of the students to a program of this sort in Los Angeles has been extremely favorable. They never skip this particular class; in fact, they come earlier and earlier, and it was recently discovered that they had been cutting another class in order to come for this particular field trip.

Dr. Alan Moncrieff, Professor of Child Health at the University of London (U.K.), asked for the views of the panel as to whether it is necessary or desirable that pediatrics should come into the final examination.

Dr. Vahlquist said that it was hard to compare Sweden with Great Britain in respect to the final pediatric exam. In Sweden about eight or ten disciplines have compulsory examinations. Pediatrics is one, and no student could get his M.D. without having passed the pediatrics examination.

Dr. de Silva noted that examinations in Ceylon are more or less based on the British system of exams for final graduation, but two of the final questions in the medical examination are always on pediatrics, and every student must answer these two questions. Second, every student has to examine one child in the clinic and also to do a very short spot case, which is usually a child.

Dr. Reginald Lightwood, Director of the Pediatric Unit at St. Mary's Hospital, London (U.K.), in response to a question about the home care project of the Pediatric Department of St. Mary's Hospital and its contribution to the post-graduate education of family doctors,

noted that St. Mary's Hospital Medical School is an undergraduate school and does not, therefore, undertake formal postgraduate teaching. The Home Care Project is, however, able to give general practitioners direct contact with hospital staff. Its main object is to assist them in the care of sick children at home, breaking down the barriers between family and hospital doctors. The hospital pediatric staff taking part in this domiciliary service make continuing professional contacts with the general practitioners of the area, thus helping them to keep in touch with modern pediatric thought through the diagnosis and treatment of their own cases. A further point is that, since hospital care is extremely expensive, this plan furthers adequate care at home for many children who might otherwise have been unnecessarily admitted to hospitals. One reason for the latter situation is what might be called the hospital vacuum—in order to keep the hospital busy and the staff contented, patients are sometimes admitted more readily and kept longer. At the other extreme, hospitals which are tremendously busy, such as in parts of Africa, are able to take only the front of the queue. Under these circumstances, the home care scheme is very valuable because it relieves the pressure from some types of cases which can be cared for at home. A beautiful example of this is the service at Alexander Township, an area just outside Johannesburg with some 80,000 native population, very short of ordinary health services and almost devoid of hospital care. The home care service has been remarkable and has contributed very greatly to medical education, because the students in their final clinical year take part in the domiciliary work.

Dr. Seymour Heymann, Chief Pediatrician, Transvaal Memorial Hospital for Children, University of Witwatersrand, Johannesburg (Union of South Africa),

when asked to comment further, said that this clinic is actually run by the students themselves. They made themselves responsible for financing it and, although they are partially subsidized, collect the funds each year through drives, which makes them particularly interested. Of course, the clinic is run by medical men, and the students work there under their supervision. Each block of students live at the clinic for a certain period, about 2½ weeks, and pay visits to the homes. Furthermore, students have to learn to practice medicine by using the simplest of measures. There are no laboratory facilities and no x-ray department of any significance; they have to learn to treat the patient as a large number of doctors have to do when they go out into country districts.

Dr. Jean Sénécal, Professor of Pediatrics, Institute of Higher Studies, Dakar (French West Africa, now Republic of Senegal), said that Africa is probably the region where medical education is least developed, and this is also true of pediatrics. The problem at Dakar is further complicated, since the School of Medicine is a national school—that is, it awards a diploma recognized in France—which requires maintenance of certain educational standards; on the other hand, as a school in the heart of Africa, it has a responsibility to train the number of physicians Africa needs. In French Africa, for example, there is one physician for 30,000 inhabitants. In this area preventive medicine has great priority, which means concentrating on children, particularly important since infant mortality is so high.

At Dakar it is considered indispensable to have a health center attached to the pediatric clinic. There the student learns to do vaccinations and to teach mothers how to care for and feed their children and how to protect them from parasites. However, the real problem is not how to

teach preventive medicine for the large city where there are specialists, laboratories, x-rays, etc.; rather, it is how to prepare the doctor who will have to care for 40,000-50,000 inhabitants, at distances of 50 or 100 km., and will be all alone, with a shortage of nurses and other collaborators. A family protection center 100 km. from Dakar has therefore been set up where students can learn the practical approach for true rural conditions.

As has been mentioned for Chile and other places, a family is assigned which the student can follow and visit regularly to learn the course of child development in health and disease, from pregnancy onward.

Another point is that in view of the relatively small number of hours assigned to pediatrics—around 300—colleagues teaching chemistry, physiology, and anatomy are asked to emphasize pediatric aspects. Frankly, success has not been great, but there has been good cooperation in having certain specialists—for example, the professor of parasitology—take part in the pediatric course. The same has been true of pathology and bacteriology.

Dr. Stokes, Moderator, concluded at this time, thanking all the members of the panel and the discussants from the floor, and expressing regret that there had not been time to recognize all who wished to be heard and who would have brought still more ideas to the discussion.

PREPARATION OF PEDIATRIC SPECIALISTS AND TEACHERS

After a brief recess, Dr. Ross introduced Dr. Alan Moncrieff, Professor of Child Health at the University of London (U.K.), who introduced the other members of the panel: Drs. Chute, Dombrovskia, Fanconi, Lelong, and Sano.

He noted that it had been decided to limit the discussion to two types of

specialists in pediatrics: namely, what might be called the family doctor specialist in pediatrics, and the hospital consultant, which also includes the teacher.

Dr. Julia Dombrovskia, Professor of Pediatrics at Moscow University (U.S.S.R.), when asked for what purposes pediatric specialists should be trained and what role they should play in the community, said that in the Soviet Union pediatricians are prepared in schools of pediatrics. Each year more than 4,000 pediatricians are graduated, but the country has a very great need for pediatricians, particularly in the small villages. Great importance is therefore given to this, and students are encouraged to work in scientific circles so that they will not become overly specialized. Pediatricians in the out-patient services have close liaison with the hospitals, since in the U.S.S.R. this type of union is considered exceedingly important. Every young pediatrician receives 2 years of specialized preparation in hospitals, and those who are outstanding may remain for a longer period to be candidates for a scientific career. Pediatricians should be trained to be the true family physician from the standpoint of helping children in the process of growth and development as well as in the treatment of sick children.

Dr. Guido Fanconi, Professor of Pediatrics at the University of Zurich (Switzerland), in answer to a question about what conditions of staff, facilities, and relationships to community health services a school or hospital must have in order to train specialists in pediatrics, noted that there were two kinds of children's hospitals: first, the large one with all services, like the Kinderspital in Zurich (such a hospital must be big, 200-300 beds), and, second, the pediatric service in a general hospital (such a hospital must have at least 100 beds).

The staff differs from one country to

the other. He believed it necessary to include teaching in surgery, and in Zurich every pediatrician must spend at least 3 months in the surgery department. Every children's hospital should have assistants specialized in other fields, such as psychiatry, neurology, neurosurgery, hematology, endocrinology, and perhaps also in handling the treatment of handicapped children. Those learning to be specialists should rotate through these departments. It is very important to have frequent staff meetings, often with professors from other departments such as pathology, internal medicine, and so on.

It is very useful and important that assistants go to the well-child clinic. Staff meetings are frequently held with the school physicians and with the psychiatric clinic. He was very happy to have in his hospital the Growth and Development Center of the Centre International de l'Enfance, because his students could thus better study the problems of normal growth.

A teaching hospital must have research work going on, and in Zurich the older assistants always have research work. In Switzerland, as in other countries, it is not possible to have assistants for research work only.

It is vital to have a good library in a children's hospital.

Dr. Moncrieff, Moderator, asked Dr. A. Lawrence Chute, Professor of Pediatrics at the University of Toronto (Canada), to comment on hospital size, because some people felt that the hospital in Toronto was possibly too big. Dr. Chute answered that he did not think there was a definite limit to the size of a hospital. Unfortunately, although his hospital already had 630 beds, his surgical confrères were anxious to have more, and another 120 were to be added shortly. It might be that in certain areas, serving a large community or perhaps

a whole country, there should be one or two very large centers where highly specialized procedures could be undertaken. Only by concentration in such centers is it possible to achieve adequate training in these specialist procedures. If they are diffused in small centers, there often is not enough material for one person to get enough experience. This is the only reason for one or two very large institutions in a country.

Dr. Marcel Lelong, Professor of Pediatrics at the University of Paris (France), in answer to a question on whether a specialist in pediatrics can have his training limited to a general hospital where perhaps there may be only 50 or 60 beds in the children's department, taking into consideration that it may be the only pediatric unit in the community, said the answer must differ according to local situations. He believed that the ideal was for pediatrics to be completely autonomous in an independent hospital which had all the specialized facilities. He thought that if pediatrics wished to have an independent existence in the future, it must make every effort always to be autonomous in independent institutions for children. On the other hand, while this was the ideal, one must take into account the realities and the fact that in accordance with the size of cities and their demographic conditions, it was certainly necessary to foresee a pediatric division in a general hospital. Both systems thus can exist, but he reiterated his preference for that which had already existed for a century and a half—an independent children's hospital wherever possible.

Dr. Tamotsu Sano, Professor of Pediatrics at Sendai University (Japan), in response to a request to discuss the personal characteristics and preliminary preparation a candidate should have in order to be accepted for training as a specialist, noted that it was obvious that

he must have in high degree the characteristics always required for the good physician. Furthermore, anyone wishing to be a competent pediatric specialist must have a true liking for children and, in Dr. Sano's opinion, needed to have a real interest in the preventive and community aspects of pediatrics. Preliminary preparation would vary somewhat according to local customs and traditions, but everyone should have completed a well-balanced general medical training and should be well grounded in physiology and pathology. He urged that pediatric training should never be stereotyped.

Dr. Moncrieff, Moderator, commented further that anyone going to be a specialist must be a good teacher or have a liking for teaching, because he was going to have to do a lot of that; and if he became a hospital pediatrician he was almost certainly going to have to do, whether he liked it or not, a certain amount of administration. As regards preliminary preparation, should a pediatric specialist take a postgraduate year or two in general medicine or should he proceed straight through to become a pediatric specialist? It worried him a bit to see somebody go straight to a pediatric internship and never in his whole life see an adult patient again. As a consultant specialist advising family doctors in general practice, surely it is essential to know something about family doctoring. It would be a very good thing if all consultants in pediatrics spent perhaps 3 months doing local work for family doctors. If they went out of the hospitals to the field they would have much greater appreciation of the difficulties of a family doctor.

Dr. Chute was then asked what should be the essential content of specialized training and how much emphasis should be placed on social and public health content, and answered that any special-

ist must have a great deal of fundamental knowledge in his subject. Osler said that to study the phenomena of disease without books is to sail an uncharted sea, while to study books without patients is not to go to sea at all. The credo in Canada is that the only satisfactory type of training for a specialist is through a residency in a teaching hospital that has well developed departments of pathology and bacteriology; if it is not solely a pediatric hospital, the departments of medicine and surgery, of course, should be teaching units as well. Dr. Fanconi had already pointed out the tremendous necessity for interrelationship in these fields.

As to duration of training, in Canada 4 years of postgraduate training are insisted upon after a year of rotating internship. Two years should be spent in general training in all aspects of pediatric medicine—the first year in rotation through the out-patient department, both medical and surgical, the newborn department, the infectious disease service, and the well-baby clinics, with the major time spent on the wards learning the minutiae of history taking, physical examination, and the importance of the detailed examination and the chronological history of diseases. After all, a specialist must know his subject matter first, and Dr. Chute thought that undue emphasis had been placed on the need for the pediatrician to know in detail subjects such as public health, although he should of course know about the public health facilities in his community. He believed that public health officers should have a year's residency in pediatrics rather than that a pediatrician, who is acting as a specialist, should take a year's public health training.

This, of course, will vary greatly from one community to another. In communities such as those described by Professor

Achar, the pediatrician is obviously going to do public health work, but for a pediatrician to become all things to all men diffuses him so much that he does not attend to his business as he should.

In the third year of training, after having spent 2 years in general pediatrics, a man should concentrate on cardiology, neurology, pathology, or some other specialized field. A child too often must be referred to an internist with a subspecialty instead of to a pediatrician because pediatricians with the necessary specialized knowledge are not available. In his third year, also, the individual should have basic science training of 6 months or even a year in the specialty in which he is going to proceed. The training program should include, as Dr. Fanconi had already mentioned, frequent rounds which involve the staff as a whole; and the whole field of pediatrics, in diagnosis and treatment of disease, needs to be thoroughly covered in both physical and psychological aspects. Dr. Chute concluded by saying that the pediatrician should be in truth a specialist and not a tinker in all subjects. He must have, of course, like any educated person, a broad knowledge of how other disciplines and other necessities impinge on him, and, depending upon the part of the community or the world in which he lives, he may have to give more or less attention to community health work.

Dr. Moncrieff, Moderator, commented that the program Dr. Chute outlined was equally applicable for the "family doctor" pediatric specialist or for someone who is going to be a specialist in a hospital sense or a teacher.

He then posed the next question: How long should the training period last, and is it feasible or desirable to have different periods of training for different levels of specialists? How does the state

of medical care in a country affect this program?

Dr. Lelong believed that the answer to the first question depended to a large degree on the answer to the second, to which he would therefore respond first. He thought that there needed to be different categories of pediatricians, each of which required a separate program and duration of studies. He wished to stress once again, moreover, the need for adequate pediatric training for the general practitioner. With regard to the qualified pediatrician, the true specialist, he thought one must consider the needs of the maternal and child health organizations, the child guidance clinics, the nurseries, and the creches, and also the need for educating mothers; and all of these both in the rural regions and in the cities. These specialists need post-graduate—that is, postuniversity—preparation. The first year of these studies, designed really for the general pediatric practitioner, should be eminently practical rather than theoretical. Students are required to spend an additional year in the children's hospitals among the various services and subspecialties, including some time in a maternity hospital. This is oriented more toward supervision of child development than clinical pediatrics, since one is interested in the premature and newborn as well as the infant. Psychological, psychiatric, and social problems are given considerable emphasis.

The true pediatric specialist is really a hospital physician who also takes part in teaching, and he requires 4 years of further training in addition to the normal university training of the physician. How these 4 years should be divided can vary considerably, in accordance with the desires of the student. At least 2 years should be spent in general pediatrics, including the nursing and the newborn, and the 2 other years can be

spent among the subspecialties such as cardiology, pulmonary diseases, psychiatry, or others. Here the student must learn more about the laboratory and biologic techniques. Considerable thought has been given to possible reduction in this cycle and to further use of hospitals in cities other than Paris.

Finally, he repeated again his belief that present-day pediatricians have to have a good deal of practical as well as theoretical instruction.

Dr. Moncrieff, Moderator, himself responded to the last question, what special steps should be taken to prepare professors of pediatrics and how much training should be given in teaching methodology, by pointing out that he was a self-educated professor and strongly suspected that most other professors in the room were in the same state. Ought one to do more than provide a period of travel to other centers at the time of appointment, and refresher periods in sabbatical years, to help the professor keep his balance and have an open mind receptive to new ideas? He had thought that there was a corpus of information on how to learn to teach, but after consulting specialists in education he rather doubted it. One can learn a certain amount of methodology and such elementary things as voice production and how to conduct a seminar; one can discuss the value of the formal lecture as against the small group; one can learn about visual and other special teaching aids—but the fundamental point of how to express oneself is something one is born with.

On the research side, there is probably more to be done. A period of six months, or longer, working directly in a laboratory discipline, will help one to understand organization of research methods. Instruction in the use of statistics is vital for all professors.

A rather special problem exists for

overseas students, who should be taught more about field work and surveys. An important task of professors is to help junior colleagues prepare papers, even in such elementary aspects of this job as the best method of using references, the use of diagrams, the use of illustrations, and, above all, clarity and succinctness of expression.

A personal point has to do with the difference whether the professor of pediatrics is going to deal with undergraduates, or with postgraduates, or with both. Dr. Moncrieff doubted whether it was a good thing to have a highly specialized postgraduate professor who does not get the undergraduate stimulus; if he were planning the work at Great Ormond Street again, he would have arranged some contact with undergraduate work.

Dr. Charles A. Janeway, Professor of Pediatrics at Harvard University (U.S.A.), opened the discussion by commenting that it was interesting to hear from Dr. Dombrovskaia that the training of pediatricians in the Soviet Union is similar to that in the U.S.A., in that the bulk of pediatricians are being trained really to be family doctors for children rather than to be specialists, except in the limited sense which Professor Lelong had described in his middle level of training. Some feel it might in the end be better to go back to the system of family doctors if people could be trained for family medicine as distinct from general practice, which, in the sense of doing everything, is a totally outmoded form of practice in a modern country. Perhaps ultimately there may be combinations of caring for mother and child or for the medical and psychological ills of families. Many pediatricians in America are functioning in very much this way.

Second, the matter of size of hospitals—it seemed to him that beds are not the

end of the pediatric line; rather, it is the out-patient department which is the heart of a hospital or university medical center, just as the heart of practice is the office of the doctor. One ought to talk more about how many out-patient visits there are per year.

Dr. Janeway agreed strongly with Dr. Moncrieff and Dr. Sano that pediatric training should never be stereotyped, that is, fixed in a pattern. He was also one of those in the U.S.A. very resistant to the crystallizing of training by boards which decide who is a properly trained person, unless they do what the American Board of Pediatrics has done and leave it flexible as to how their requirements are met. People are different; the kinds of practice they are going into are different; their contributions to teaching are going to be different. Training should thus be capable of being varied for the individual, with certain broad limits. Dr. Janeway thought there were many roads to being a well trained pediatrician; this was probably in self-defense, since he was very probably the only professor of pediatrics in the room who had never had any pediatric training except in medical school and finally on the job. He agreed with Professor Moncrieff, but for slightly different reasons, that some training in general medicine is important for the pediatrician. A point often forgotten by those who have a strictly pediatric training is that the pediatrician functions, both in diagnosis and in treatment, through an adult: the parent. It is thus extremely important that he understand adults. The person whose training is restricted to a pediatric hospital deals with adults only in an authoritarian position, which provides inadequate preparation for visiting homes and counseling mothers. Family care programs will help to improve this aspect of training, but a year as a medical intern, in contact with adult patients 18-

20 hours a day, seeing them under various types of stress, gives great insight into adult behavior and helps prepare for neurotic, paranoiac, and schizophrenic parents.

He agreed with Professor Lelong that training should be predominantly practical. People learn best by doing, under supervision; by having to take responsibility. No amount of demonstration or lecture can ever be a substitute. In the U.S.A. there has been quite a revival of interest in teaching teachers to teach. Interesting experiments are going on in which people experienced in the field of educational psychology are studying medical educational techniques carefully and running short training programs for medical teachers. These have been most helpful to those who attended. A person cannot be made an inspiring speaker, but he can learn more about how to do certain things better. A small group of people, focusing during a few weeks on educational techniques, under the guidance of a person really trained in them, can learn a good deal. He was interested to note Dr. Moncrieff's skepticism but had been impressed with the assertion of the educational specialists that they had to study medical educational procedures intensively before they could be helpful.

Finally, the function of all medical teachers and medical teaching institutions is threefold: first, they have to care for patients just as any doctor does, but to do it better than anybody else; second, they do have to teach, to pass on knowledge for the future; and, third, they must carry on research, looking behind disease to learn more about children and their physiology and behavior. Research may be fundamental or it may be practical; for example, better treatment or control of a specific disease. The spirit of inquiry must permeate the university clinic if it is going to train people to be critical—to enable the prac-

titioner to withstand the deluge of medical literature and particularly the output of the pharmaceutical firms, which are anxious to have him use every new drug that appears and throw away everything previously employed. A highly critical spirit can best be developed where people are criticizing themselves every day by examining what they are doing with research techniques.

Dr. Moncrieff, Moderator, hoped that people would not go away with the impression that all parents in Boston fall into the categories mentioned by Dr. Janeway. There are awfully nice parents there as well! He was pleased that Dr. Janeway had emphasized the obvious yet often overlooked point that children are treated and diagnosed through their parents. On the other hand, Dr. George Frederick Still, Dr. Moncrieff's old chief, was a bachelor and terribly shy with grown-up people. He would not have understood Dr. Janeway's point that it was essential to work through parents, because he was frightened of parents. One can still be a good pediatrician even if frightened of parents.

Dr. A. Biesine, Professor at the University of Riga (U.S.S.R.), wished to add to what Dr. Dombrovskaia had said about the training of the pediatric specialist, that in the Soviet Union training in pediatric surgery begins in the medical schools which have a specialized chair of pediatric surgery—primarily general pediatric surgery, but including also divisions such as emergency treatment and thoracic, pulmonary, cardiac, orthopedic, ophthalmologic, and otologic surgery. Advanced specialization begins in each of these fields after the 6 years of basic training. In the special program, one must work in the specialized clinic for at least 3 years. It is important to note, however, that the people interested in these specialties have already formed a group in the medical schools which

can interest the young student and familiarize him with this aspect, as preparation for specialization later on.

Dr. Nathalie P. Massee, Director of Education at the International Children's Centre, Paris (France), commented that in the preparation of pediatricians, whether for teaching pediatrics or for work in specialized fields, but particularly of those responsible for maternal and child health services, there is an important place for international meetings and graduate courses where people from the several countries can meet. In 10 years of such experience at the International Children's Centre, 57 courses have been organized for more than 500 persons. It has been difficult to adjust to the needs of people from so many different countries, but she believed the teaching has been very profitable. In the career of a responsible pediatrician it is highly desirable to arrange a short period of some months in which he can meet and work with similar specialists from other countries.

Dr. Vahlquist noted that when one discussed the type and duration of training for future specialists, one had to consider their future tasks. In Sweden, for example, pediatric specialists may follow four routes: teacher at school or medical center; head of pediatric department in a general hospital; consultant in smaller hospital; and, finally, practicing pediatrician. Pediatrics is very decentralized; for a population of about $7\frac{1}{2}$ million in a comparatively large country, there are about 40 well qualified pediatric units extending all the way from the Arctic Circle to the south of Sweden. Each of the 25 counties has one or sometimes two such departments under a full-time pediatrician. They not only care for children in the hospitals but also are often advisers to the county councils in child welfare activities. All Swedes agree that these departments, spread out over

the whole of the country, are necessary and that specialists must be trained to head them. General practicing specialists are not likely to be too numerous in Sweden. Therefore, differentiation of training is not a problem, but the one pattern is elastic to some extent.

About 8 years ago the training time was 3 years after M.D., then it increased to 5 years, and a committee now at work will probably end up with a recommendation of 6 years. Three years are in general pediatrics and the others may be selected topics. One of the reasons for the increase is to allow the inclusion of child psychiatry, perhaps children's surgery, and a half year of work in general practice. One important point is that, out of this total training period, one year must be at the University; more is not usually possible, since use must be made of the good training facilities in the county hospitals.

Finally, one word about refresher courses. Some 10 years ago regular training courses were started, especially for the heads of the pediatric departments in the county hospitals. These courses are almost 100 per cent attended, although they last for only 3 or 4 days.

Dr. Sénécal raised the question of whether, under the difficult conditions of tropical Africa to which he had referred in the first panel, it was necessary or possible to prepare pediatric specialists. He believed that the answer had to be yes. The first category which has to be prepared is the specialist, who is needed for the pediatric services in the hospitals of the large cities and who must also take part in the preparation of paramedical personnel. To prepare this type of person, the French system envisions a training period of 4 years after the university, of which one part was carried out in Dakar and another part in Paris. For the moment one cannot think of the preparation of "family pedi-

atricians." In a country with only one physician for 30,000 inhabitants, the general practitioner has to know pediatrics. For this purpose refresher courses, even in as short a period as 3 days, had been successful for rural practitioners, sometimes with an intensive period over a weekend. Finally, and here perhaps he would cross swords with the Moderator, he wished to insist on the need in these countries to prepare public health specialists. This question was possibly a bit apart from that of the session as a whole, but he thought it of importance for further study.

Dr. Stokes wished to add a brief word, because mistakes are always worth recording. At the University of Pennsylvania, which has had one of the relatively few postgraduate medical schools in the U.S.A., students were formerly taught almost entirely from seminars and lectures. It has been found necessary to change to actual work with patients themselves in the out-patient department, which he agreed with Dr. Janeway is the most important area for training in postgraduate work. Use is made of the specialized clinics and the health conferences, particularly for "psychological pediatrics." Contact is also arranged with men who are doing research, which gives students an idea of the on-going progress of medicine and pediatrics. It is, of course, important to continue the basic science courses.

Dr. Lázaro Benavides, Assistant Director of the Children's Hospital of Mexico, said that in his hospital, originally created primarily for pediatric care, the educational and research programs have expanded greatly in the last 10 years. In the first 2 years the interns have an established academic program, with periodic partial examinations, and at the end of the 2 years they have to pass a written and oral examination and present a thesis. Among the interns the best

are chosen for another 2-year appointment as assistant residents; the first year is devoted to a specialized field, including basic science material, epidemiology, immunology, statistics, etc., and the second is spent in a specialized pediatric research laboratory. There are also 10-month postgraduate courses for general physicians desiring to improve their pediatric knowledge.

Dr. Chute, after the Moderator had invited the panel to make a final comment on the points raised, emphasized the need for every community to decide who is to look after the major portion of the child population—the general practitioner, the specially trained pediatric general practitioner, or the general practitioner in association with a consultant. This decision determines the type of teaching to give to undergraduates who will go off to general practice. Certainly, in a country that has large rural communities, extensive specialist services are unlikely. Thus, for the most good to the greatest number of children, it is necessary to increase the amount of pediatric content to the general practitioner. He should, of course, have access to consultant pediatricians. There will be great diversity in various countries, but there is a fundamental need to make sure that the general practitioner has ample training in pediatrics.

Dr. Moncrieff, Moderator, finished his part of the proceedings by thanking the panel and all discussants and by repeating a story Dr. Hughes had told him. In his traveling lectures he found that if one wanted a nice, warm, comfortable room to talk to the local practitioners, with nice easy chairs and perfect quiet, one should organize the groups in the rooms of the local funeral director!

Dr. Ross, Chairman of the Special Session on Pediatric Education, then invited Dr. Wegman to summarize the morning's discussion, complimenting him

on having organized an enjoyable and very valuable supplement to the IX International Congress of Pediatrics.

SUMMARY

Dr. Myron E. Wegman, Secretary General of the Pan American Health Organization, which serves also as Regional Office of the World Health Organization, emphasized that if it had been difficult in the period of one morning to cover the entire subject of pediatric education, how much more difficult it was to summarize 3 hours of extraordinarily interesting discussion on this broad subject.

The basic objective of pediatric education for all physicians had been made very clear—to help the physician acquire an understanding of the child in health and disease and to awaken in the physician a warmth and interest in children, a liking for children, and an understanding of what they need as part of the family group. Need for continuing education in pediatrics was emphasized repeatedly.

Much had been said of how conditions in the various countries influence teaching content and methodology, but there had been general agreement that some basic things need to be taught to every physician. He needs to know something about growth and development; he needs to know about infant feeding; he needs to know about immunizations; he needs to know the natural history of disease in childhood. Beyond these items there will be substantial variation. In countries where 50 per cent of the population is under 15 and where the major causes of death are infectious diseases, the content of teaching must be different from that in countries in which only 25 per cent of the population is under 15 and where infectious disease has been reduced to minor proportions. Not enough emphasis had been given to teaching

nutrition; physicians need to know more about it in the well developed communities as well as in those with serious food lack.

As to organization of the pediatric course, obviously there had been considerable difference of opinion. Emphasis was placed on the need to teach pediatrics throughout the curriculum and on the advantage of the "block" system—that is, of concentrating on pediatrics at some stage so that the student may carry away a basic concept of methodology. Since all children's diseases cannot possibly be covered in medical school, if the student has a solid grounding on how to approach any disease he will have an asset to carry through life.

It had been emphasized again and again that the out-patient department is the key place where pediatrics needs to be taught, that this is at the heart of good teaching. Here mother and child are seen together, here are seen the great majority of the problems which the physician will face in practice. If all in attendance at this meeting were questioned, many would say that they did not work in the out-patient department as much as in the wards. This was pointed out as a situation to be corrected, for if the professor or the head of the department goes into the out-patient department, he will give it more status and others will come to realize the teaching potentiality there.

The danger of too many patients had been noted and should be emphasized. An excessive number of patients leads students to take short cuts that they are not experienced enough to know how to take; superficiality and "snap" diagnosis are glamorized.

Better use of audiovisual aids had been advocated, and it was urged that a system be developed for circulating audiovisual aids which have been devel-

oped in different parts of the world, although it was pointed out that the most effective audiovisual aids are those produced locally, with local experience.

The future character of the physician's work must be considered carefully in planning his pediatric course. One participant had noted that 65 per cent of the graduates in his school were going into some specialty. Of these, about 4 per cent go into pediatrics; the other 61 per cent of the future specialists are a source of concern, since they need to have a better general grounding in pediatrics while in medical school.

Correlated teaching had been given great importance, the most obvious areas being with obstetrics regarding the newborn and with preventive medicine regarding the whole field of child health; physiology and pathology were also singled out for special attention. The value of personal contacts among professors had been noted and also the desirability of joint appointments of teachers in several departments to help achieve this correlation.

There had been a good deal of emphasis on various ways to work with community services, not only in health centers but also through arranging for students to go into homes. Many remarks had been made on the family approach, and there had been an interesting description of an African situation in which the students of a university support a health center. This means that the individual student must inevitably have much greater interest in following through on the care of these patients.

The special problems of areas where there is one physician for 50,000 people must concern all, since, unfortunately, a large part of the population of the world is located in these areas. Effective techniques have been developed to extend physician services through the use of paramedical personnel, but more study

is needed. Various methods of post-graduate training were cited: courses, conferences, circulation of material, visits of consultants, and itinerant teachers.

It is difficult to define precisely what each country needs in number and type of specialists. It had been suggested that each country, and possibly each community within a country, had to decide the pattern of its medical personnel. How many general practitioners are needed is related to how easily they can call for assistance from hospitals staffed with specialists. How many specialists depends to a considerable extent on the character and length of training. A program had been described in which 1 year of concentrated graduate training was aimed at improving the physician's ability to care for children but not necessarily to make him a consultant. There are all sorts of variations possible which merit serious examination within countries.

There had been much discussion about the size and facilities needed by a hospital for the training of specialists, and a figure of 300 beds had been suggested as a minimum. Dr. Wegman added a personal note here, since he himself had been trained on a pediatric service of about 60 beds in a general hospital. The world renown of this service and the number of professors it has produced made him feel that, within limits, the number of beds is less important than thoroughness of work-up and an atmosphere of study. His subsequent experience as the professor of pediatrics in a very much larger institution had convinced him further that, whereas there was advantage in number of patients, the small, well-staffed unit had great strengths. Reference was again made to the need for a strong out-patient department.

As to the qualities needed to be a specialist, it was pointed out that the

word "doctor" means "teacher," and the specialist, whether he is in a hospital or a practitioner, is always a teacher; he ought to have a vocation for teaching. He needs to be a well adjusted person; he needs to have a sound general preparation.

The content of the training program had been outlined by several participants —time did not permit a proper summary other than to emphasize the need for basic training, balanced hospital and out-patient experience, contact with specialized services, particularly related to psychological problems, and participation in research. Several discussants thought there was need for more subspecialists, in pediatric neurology, orthopedics, and other specialized fields.

With regard to the training of professors, most of the participants in this meeting had probably learned to be teachers by apprenticeship, but interesting experiments are now going on, utilizing educational specialists—people who are not physicians—to make critical observations of pediatric and other medical teaching courses in order to discover weaknesses and possibilities for improvement. Pediatric professors should not be annoyed when a pedagogic specialist tells them how to do a better job of communication. Communication is a science in itself, and all have room to learn.

The need to have active research going on in pediatric departments had been brought up several times, and its importance was widely recognized. Search for new information is conducive to a general attitude of inquiry, so important in the training of the younger man, particularly in helping him to critically evaluate well publicized therapeutic measures. The training of the maternal and child health specialist should have had more discussion, but time had not allowed it. There had been repeated emphasis on prevention and how essential

it was for organized public health to have personnel properly trained in the special problems of children and aware of how pediatric techniques and knowledge can be used to benefit the family group in the general public health program. Great variation had been described in the length of training of the specialist, from as long as 7 years to as short as 1. Obviously, the responsibilities assigned should be commensurate with the training.

One question on the training of professors which had not been asked is how professors should be chosen. This is a subject possibly for another conference.

Finally, several participants had pointed out that a deficiency of the

day's meeting was that all present were already "converted" and convinced of the importance of improved training in pediatrics. Most of the recommendations here were not new. There has been a WHO Study Group Report, but how much influence has it had in improving pediatric training? The deans must be convinced as well as the surgeons, the anatomists, and others, that pediatrics is one of the foundation stones of good medical education.

During the interval until the next Congress in 1962 it is to be hoped that the present meeting will be a stimulus to more study, to more critical self-evaluation, to more new ideas on how to do a better job.

The Effects of "Examinations in Crises" on the Study Motivations of Medical Students*

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INTRODUCTION

An important factor in education is that of an appraisal system for the determination of student accomplishments. The intelligent application of such a system is based on three sequential factors: the definition of a goal of achievement; the establishment of criteria to assess the acquisition of skills; and the application of a technique capable of measuring qualities as determined by the accepted criteria.

If, for example, a course in art is to be established to study floral displays, the first consideration is that of objectives. What is the purpose of such a course of studies? Is it to train horticulturists in the preparation of commercial floral exhibits or is it to educate housewives in the artistic decoration of their homes?

Once the goal has been defined, the next step in the establishment of an examination system is that of selecting criteria by which to judge the acquisition of these skills. Should the criteria of judgment be limited to colored sketches of a well balanced bouquet of flowers, or to the preparation of a floral display from an assortment of cut flowers, or to the actual growing of flowers ultimately destined to be arranged in artistic fashion? Having established basic objectives and the criteria by which to judge the

achievement of these objectives, we are prepared to develop and apply a system to measure the ability of the student. If the criteria of evaluation include the actual growing of flowers, then the examination system must of necessity be more comprehensive than if related only to the painting of a bouquet.

Lest there remain doubt as to the distinct difference between the second and third factors in this triad, let us carry the analogy of the course in floral displays a step further. Let us say that, as a measurement of the acquisition of skill in this course, the two criteria established are those of arranging a bouquet and the painting of it in color. Some educators may argue that this is the final step in the appraisal of accomplishment, but it is not. In a real and factual sense up to this point examinations have not entered into the scene. How does the teacher now determine that the bouquet and painting are artistic? This is the examination in the true sense of the word. Does a floral display made up of a riotous profusion of colorful flowers, or a single flower arranged in sombre simplicity, portray artistic ability? It is the function of the examination in this case, in keeping with established criteria based on the objective or purpose of the course of study, to evaluate the skill of the student in arranging and painting flowers.

The techniques utilized to evaluate student comprehension of subject matter influence study motivation to a profound degree. The student soon learns to mold

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his aims and habits of study to conform with the evaluation methods. Crude examination techniques will stifle and even destroy creativity, and the consistent application of inconsistent methods of progress assessment will warp student motivations in education. It is disturbing to note how few teachers recognize the inherent dangers of poorly planned and poorly applied examinations.

Directing our attention to the problems confronting medical education in India, none are more critical or have a more serious long-range potential for influencing the professional stature of our physicians than those relating to the examination systems currently in use. Instead of a logical assessment of goals, criteria, and techniques of evaluation, examinations in large part appear to be unrelated to these factors and are exerting their influence in an atmosphere of pressure and fear. In place of leading the intellect into fields of healthy creativity, medical students, by virtue of the content and method of application of examinations, are forced into roles of receptivity becoming the passive repositories for tidbits of scientific facts.

Symptoms of a certain uneasiness in the community conscience of medical educators are evidenced in the recommendations of the Medical Education Conference held in New Delhi under the auspices of the Ministry of Health in November, 1955. The recommendations were also approved by the Health Minister's Conference in February, 1956, and the pertinent portions of these deliberations read as follows:

"The Conference is unanimously of the opinion:

- a. that the present methods of examinations and assessment are unsatisfactory;
- b. that written examinations require considerable modification;
- c. that much greater importance be

given to the day-to-day assessment of the student during the period of study than is being attempted at present; and

- d. that it is necessary that scope should be given to experiments in assessment by such medical colleges as are willing to undertake them."

The late dean of American educators, Dr. Alan Gregg,¹ in writing of his impressions of medical education in India during his visit in 1952, has this to suggest, "Change the spirit and purpose of examinations in the medical colleges . . . Give monthly examinations and act on accumulated proof of incompetence by refusing the student the privilege of an education he can not take though there are plenty of others who can."

Again in 1957, Dr. Benjamin G. Horning,² medical education consultant to the International Cooperation Administration, wrote in a memorandum of his visit to India that, "There was an over-emphasis upon examinations in both the selection and the promotion of students."

In the face of these statements, particularly the recommendation of the Medical Education Conference in 1955, it is disappointing to note the almost total neglect of this problem in the recorded deliberations of the Medical Education Conference held in March of 1958. The only reference of examinations, and this an indirect one in the summary record of the proceedings, is that made by the Chairman, Dr. J. C. Ghosh³ in his introductory remarks. This reads as follows:

"I must confess to a feeling of disappointment that not much progress has been made in improving the quality of

¹ Alan Gregg, *Impressions of Medical Education in India*, 1952.

² B. G. Horning, *Memorandum of a visit to India, 1957*.

³ Medical Education Conference, 1958. *Summary Proceedings, Central Health Education Bureau, Directorate General of Health Services, Ministry of Health, Government of India*.

teaching in the medical colleges. The average percentage of passes in the final medical examination of our Universities is 40, though in some cases it is as low as 25. . . . The large percentage of failures in the M.B., B.S. examination may be more due to inadequate teaching than to indifferent quality of students."

It is in the context of the urgent need for a re-evaluation of the examination system in medical colleges that the author wishes to submit certain concepts of goals, criteria, and instruments of assessment for the consideration of medical educationists in India. With the almost explosive quantitative changes currently taking place in medical education in this land, it would be tragic indeed to fetter progress with outdated techniques of examinations, whose stultifying effects may well leave their stigmata on generations of future doctors.

OBJECTIVES OF MEDICAL EDUCATION

It is not easy to describe the primary objectives of medical education in this day and age. A century ago, during the infancy of modern medicine, the goal of the medical college or school was that of training practicing physicians. Today, although this objective certainly pertains, it is related to other equally significant ingredients inextricably dissolved into the matrix of medical education. One very important such ingredient is that of research, so much a part of the texture of the whole that frequently one is hard put to identify any part of the blended portions as wholly research or wholly education. Such an academic environment is healthful, for it leavens the atmosphere of teaching, both for faculty and student alike, with the heady stimulus of creativity and exploration. A medical college without an active research program, which envisions not only the carrying on of research but also the training of research scientists, is an institution doomed to decadence.

Another important responsibility of the medical college is that of educating teachers. In a recent editorial in the *Journal of Medical Education* relating to this problem the author¹ stated, "The concept of plentiful and healthful 'seed corn' is basic to the farmer's cornucopia. No less important to medical education is the matter of faculty replacement and expansion. . . . An evident weakness in the maturation of faculty 'seed corn' lies in the very soil of its incubation, the medical college."

Defining the terms "teacher" and "research scientist" in medical education as only those with medical degrees is not only short-sighted but wasteful of scientific manpower. This situation we can ill afford to tolerate. The doctor of philosophy in the basic sciences should be an important part of the medical faculty, with equal academic stature and economic emoluments. To demand that the chairman of a basic science department such as anatomy, physiology, biochemistry, microbiology, or pharmacology must be a man or woman with a medical degree is to thwart progress in medical education and research. Those who would argue that the pure basic scientist tends to create a chasm between the preclinical and clinical years of medicine obviously are not familiar with the many institutions where the basic and clinical scientists work hand-in-hand toward a common goal in medical education and research.

It is not the intent of the author to belabor this point unnecessarily but rather to clarify an important facet of our objectives. The flow of medical science in this day and age cannot be restrained within the bed of clinical science alone but must embrace a whole system of tributaries, tributaries which at the moment may appear quite peripheral but

¹ Melvin A. Casberg, Faculty "Seed Corn." *J. M. Educ.*, 34:1106, 1959.

on the morrow may well be embraced in the main body of the stream. Such a reality but emphasizes the breadth of objectives confronting medical education.

Mark Twain once wrote, "If your doctor knows only medicine, you may be sure that he does not know even medicine." Delicately woven into the fabric of medical education should be the firm supporting strands of a depth of cultural perception, scientific honesty, and integrity of character. This total objective may be defined as education in symmetry. Realizing that scientific methods have definite limitations, Einstein⁵ wrote: "Whatever this tool (scientific method) in the hand of man will produce depends entirely on the nature of goals alive in this mankind. Once these goals exist, the scientific method furnishes means to realize them. Yet it cannot furnish the very goals. The scientific method itself would not have led anywhere, it would not even have been born without a passionate striving for clear understanding."

In the light of pressures to mass-produce physicians, a word of warning is in order. The objective of medical education is not an "assembly line" type of production. There is a basic pedagogical error in fitting the student to an inalterable curriculum rather than making some effort to fit the curriculum to the student. The following story points out the tragic dangers of attempting to mold all students into a single academic pattern:

Once upon a time the animals decided they must do something heroic to meet the problems of a "new world." So they organized a school. They adopted an activity curriculum consisting of running, climbing, swimming, and flying. To make it easier to administer the curriculum, all the animals took all the subjects.

The duck was excellent in swimming,

⁵ Albert Einstein, *Out of My Later Years*, p. 113. New York: Philosophical Library, 1950.

in fact better than his instructor; but he made only passing grades in flying and was very poor in running. Since he was slow in running, he had to stay after school and also drop swimming in order to practice running. This was kept up until his web feet were badly worn and he was only average in swimming. But the average was acceptable in school, so nobody worried about that except the duck.

The rabbit started at the top of the class in running, but he had a nervous breakdown because of so much makeup work in swimming.

The squirrel was excellent in climbing until he developed frustration in the flying class, where his teacher made him start from the ground up instead of from the treetop down. He also developed muscle cramps from overexertion and then got "C" in climbing and "D" in running.

The eagle was a problem child and was disciplined severely. In the climbing class he beat all the others to the top of the tree, but he insisted on using his own way to get there.

At the end of the year an abnormal eel that could swim well and also could run, climb, and fly a little, had the highest average and was graduated with honors.

In recapitulation the main objectives of medical education may be described as the development of doctors competent in the prevention and treatment of disease (in its broadest sense); doctors capable of research; and doctors qualified to teach. Closely linked to these responsibilities are those for the nurturing of research. These are not separate disciplines in themselves but fractions of a whole. The graduates of our medical colleges should have varying proportions of the above ingredients. Granted that among the majority of medical practitioners there may be but slight inclina-

tion or aptitude for research, nevertheless without an inquisitive mind the healing profession tends to a stereotyped form of rote therapy. Surely we are not setting too high an objective in working toward a standard of medical education which among other things envisions creativity and scientific reasoning as a part of the armamentarium of our students.

CRITERIA OF JUDGMENT

The objectives of medical education once having been established in broad and general terms, the next step toward the assessment of student progress is the definition of criteria by which skills may be judged. It is not the purport of this paper to discuss the many details of all criteria but rather to define this area with sufficient clarity to permit an evaluation of the instruments of their assessment, namely, examinations.

In the face of an explosive growth in medical science, we must accept the fact that its comprehensive coverage in medical college is impossible of achievement. In terms of our objectives, what then shall be our criterion in respect to this particular problem? Certainly we should not establish and apply examination systems until this matter has been defined.

If, for example, the criterion is equated to an accumulation of as many scientific facts as is possible within the limited time of medical college years, then the examination is rather simple in development and application. Basically in such a situation student assessment relates to the formulation of a "cross-section" barrage of questions which act as trigger points setting off a chain reaction of mental response. Study in such an environment is simply a memory process in which bits of knowledge are filed more or less methodically in the cabinet of the student's memory, to be pulled out in self defense at the time of examinations. Under such terms of ref-

erence there is little if any incentive for creative thought.

Another concept in medical education is that in which the student is presented with a core of knowledge, the alphabet of medicine so to speak, and then taught in terms of attitudes toward diseases and their related problems. In such an environment the student is challenged to interpret facts, not as items to tax his overburdened memory, but rather as straws in the bricks of medical wisdom contributing to an atmosphere of creativity. The teacher is given the challenge to demonstrate to the students the alchemy of extracting wisdom from knowledge.

The author in a previous publication⁶ has used the following simple analogy to emphasize the comparative values of the above techniques of education:

"If one is faced with the problem of teaching the contents of a large telephone address book to an illiterate, two alternatives present themselves. Either the illiterate may memorize the names and associated numerals or learn to read. The former is a prodigious and fatiguing task requiring constant rememorization to meet the demands of a growing and changing population, the latter utilizes a basic knowledge to master the vagaries of a mass of facts regardless of their qualitative or quantitative variations."

Lyman Stowe,⁷ Associate Dean for Academic affairs at Stanford University School of Medicine, carries this thought further by stating that the medical student is essentially a graduate student and as such should not be taught in "terms of the acquisition of techniques or the accumulation of data at the expense of interpretation."

⁶ Melvin A. Casberg, *Whither Medical Education?* *California Medicine*, 91:309-20, 1959.

⁷ Lyman M. Stowe, *The Stanford Plan: an Educational Continuum for Medicine*. *J. M. Educ.*, 34:1059-69, 1959.

Linked closely to the objectives of medical education, and therefore related to the formulation of criteria for the evaluation of student accomplishment, is the fact that man is a unit and not a fractionated anatomic specimen composed of isolated visceral, vascular, and structural components, which become diseased as separate physiological units. An old French proverb epitomizes this thought by stating that: "There are no diseases, there are only sick people." Teaching and examination techniques which do not recognize this comprehensive aspect of medicine will fall short of their goal.

The sanctity of departmental boundaries with their academic curtains of exclusiveness has long been due a serious reappraisal. In the light of the unprecedented progress in medical science over the past two decades there has been a healthy spillage from one discipline to the other. What outstanding anatomist is there living today who gained his reputation purely in the field of structural anatomy? What medical college boasts of a surgeon merely on the basis of his technical surgical prowess? A two-dimensional correlation is essential to the proper grasp of the concept of the physiological oneness of individual man. On the one hand there is horizontal correlation between contemporary subjects such as anatomy and physiology, and on the other a vertical correlation between sequential subjects such as anatomy and surgery. The astute clinician on ward rounds with students not only evaluates the surgical or medical therapy of the patient with peptic ulcer but explores the possible underlying psychosomatic etiology.

If there is agreement among medical educationists that teaching should emphasize the unity of man's complex being and de-emphasize the artificial departmental boundaries of structural or func-

tional components, then this attitude should be reflected in the criteria established for the judgment of student accomplishment.

It is difficult to determine with exactness where medical education begins. The foundations for medicine are well established long before the student enters medical college. Premedical education, besides including the necessary prerequisites for matriculation in medicine, should provide a liberal and sound cultural foundation. Undergraduate medical education should not focus on narrow specializations but should relate to a common denominator of general medical knowledge to be presented to all medical students irrespective of their ultimate specialty careers. It is important that the criteria of judgment correlate with the objectives of undergraduate medical education rather than those of graduates or specialty education.

There is no intended implication in these discussions that a standard of criteria in medical education necessarily applies uniformly to all parts of the world. Nevertheless, it is presumed that those criteria presented in this paper are sufficiently broad of base to apply to medical education in general. Obviously certain criteria have been omitted primarily because they have not been considered to be critical in the development of this particular thesis in study motivations.

AN INSTRUMENT OF MEASUREMENT

Current literature in medical education is well stocked with erudite discussions on student evaluation. The pros and cons of essay type, oral, and objective examinations are argued at considerable length, breadth, and depth.

G. M. Bull,⁸ Professor of Medicine, Queen's University at Belfast, has presented certain conclusions which should

⁸G. M. Bull, Examinations. *J. M. Educ.*, 34:1154-58, 1959.

prove somewhat disturbing to those defending the infallibility of examinations. This is not the voice of one "crying in the wilderness," for leading educationists in recent years have been questioning the validity of past assumptions in the matter of assessment techniques. Concerning essay type of examinations, Dr. Bull, after careful statistical studies of examiner and student variances, writes that "the accuracy of marking is so poor that the validity is at the moment of little importance." He continues to discuss the multiple-choice or objective examinations as the most accurate, with virtually no examiners' marking error. Oral examinations are severely scored in his statement that in the light of rather good evidence "factual knowledge plays a very small part in marks allotted at interview."

An important and probably the most accurate form of student appraisal is that of observation. Medical education, replete with opportunities for informal teacher-student rapport in laboratories and classroom alike, lends itself ideally to the continuous day-to-day observation of student progress. Those of us who have followed a teaching career through the basic and clinical science disciplines are aware of the effectiveness of this type of evaluation.

Debates on the assessment of student accomplishments are not complete without reference to the fear or anxiety factor in examinations. There is no doubt that there is a certain value in this element of pressure; however, particularly at a professional level of education, such a role should be a very minor one. Evidence is accumulating questioning the effectiveness of the anxiety factor on those students who are not meeting academic standards. Miller and Erwin⁹ in a study of attitudes and anxiety in

⁹L. B. Miller and E. F. Erwin, A Study of Attitudes and Anxiety in Medical Students. *J. M. Educ.*, 34:1089-92, 1959.

medical students have concluded that "students who were successfully meeting academic requirements were significantly more anxious than those who were on probation." This may come as somewhat of a surprise to educationists who have emphasized the fear factor of examinations in relation to their effect on poor students.

Each of the types of examinations contributes to the total assessment of student progress if it is prepared and applied in an intelligent manner. An understanding of the shortcomings of an instrument of assessment will insure its more efficient application as well as a greater accuracy in its interpretation. One must not forget the profound influence of variously prepared and applied examinations on the study motivations of students. What and how students study will portray in large part the "what" and "how" of their examinations. The disregard of this fact is not merely a matter of neglect, willful or otherwise, but evidence of a lack of understanding of certain basic concepts in education.

Not only do the content and application of examinations influence the student in his study habits, but, of even greater significance (particularly when developed externally), they affect curriculum design and teaching techniques. If the goals and criteria of medical education are established as the garnering of vast numbers of facts with a relative disregard of logical thinking and experimentation, then much of teaching will be devoted to didactic lectures. This reaches its lowest state when the lecturer presents routine material, available in printed form, and expects the students to copy his words verbatim in their notebooks.

We turn from generalizations more specifically to medical education in our land, particularly, to that area related to the assessment of student progress.

Regardless of 5-year plans replete with budgets for brick and mortar, the true measurement of accomplishment in our medical colleges cannot be equated alone to beautiful and substantial buildings. A consistently weak thread running through the warp and woof of the very fabric of medical education is our examination system, a system whose influence is felt in the philosophy and techniques of our teaching as well as the study habits and motivations of our students. The author has neither the inclination nor the time to debate the issue as to cause and effect in this sequence. Suffice it to state that there is a relationship between these entities and one which is fast assuming the proportions of a somewhat vicious cycle.

Examination systems currently in use appear to be based on two false premises which are not only psychologically unsound but have been proved to be incorrect. These false premises are: first, that a student can demonstrate in a matter of a few short hours the results of 2 years of study; and second, that the day-to-day assessment of progress is not of significance in the ultimate evaluation of the student.

Let us see how these false premises are reflected in the application of examinations. There are three all-important hurdles facing every M.B., B.S. candidate: the first, second, and final professional examinations, given over a period of approximately 5 years. These landmarks are critical and irrevocable in their effect on the student and in large part extramural in their application and assessment. Those faculty members best acquainted with the day-to-day aptitudes of the students play a minor role in examinations. True, there is an internal examiner, and the internal faculty are thrown a soothing sop in the way of permission to administer a few grace marks or a small fraction of the final

grade; in reality, however, the ultimate assessment of the student is the prerogative of others than the faculty of the medical college itself. The destiny of the student relates for the most part to three major examinations given over a period of 5 years.

How does the student react to this particular environment of examinations in crises? Psychologically, his entire intellectual capacity is mobilized against these three crises in his academic career. He assumes a defensive attitude and concentrates on accumulating facts to use as ammunition in the coming critical days of mortal mental combat with his examiners. Subdued are the incentives to learn for the sheer delight of exploring the unknown. He worships at the shrine of knowledge disregarding the fact that knowledge is "a rude unprofitable mass, the mere materials with which wisdom builds."¹⁰ Interest in the laboratories and classrooms is focused on facts and techniques which relate to examinations. The naive lecturer who prefacing his remarks with the words that his presentation, while of true significance in the field of medicine, will not be incorporated in any further examination, immediately loses his audience. Advice on collateral reading, which by past experience has not been reflected in the first, second, or final professionals, falls on deaf ears. Little wonder that the student loses his sense of inquisitiveness and creativity and falls prey to the mentally debilitating habit of rote memorization.

Assessing the status of the medical student on the basis of three major examinations presents another problem which the author has chosen to call "academic hibernation." You will remember that the dictionary definition of this term is the spending of a part of the season in a torpid state. Knowing that the real hurdle lies 1 or 2 years

¹⁰ William Cowper, in "A Winter Walk at Noon."

ahead, the student is prone to procrastinate serious application to his studies, and then concentrate diligently and furiously in a short pre-examination period cramming facts. If he is bright he will probably pass the examination in spite of his academic hibernation, but the real tragedy lies in the wastage of time and the loss of effort which might have been applied to creative thinking. The poor student may not be so successful and falls into that unfortunate category of repeaters. A continuum of internal tests and observation would not only give a far more accurate appraisal of accomplishment but also remove the psychological hazard which forces the student and teacher alike toward an undue respect for the mere accumulation of facts. Parenthetically, the institutional waste of time and effort in nurturing odd sizes and segments of repeaters is an awesome matter to contemplate. To those interested in increasing the numerical output of graduates from our medical colleges, here is an area of waste which bears serious investigation.

Students working in an environment wherein the important landmarks of their academic life are equated to a few major examinations are prone to become collectors of diplomas and certificates. Dr. Stephen Abrahamson¹¹ of the Department of Education at the University of Buffalo, in discussing student reactions to the pressures of examinations, has this to say: "I have a strong suspicion on the basis of the literature in education that we make symbol-chasers out of our students. They are no longer concerned with objectives as we see them (and as possibly they saw them), but rather they are concerned with the symbols of the accomplishment of these objectives."

The faculty of the medical college do

¹¹ Stephen Abrahamson, The Learning Process in a School of Medicine. *J. M. Educ.*, 33:78-81, 1958.

not escape the insidious influence of our examination system. They also tend to focus on the three major crises which face the student, until a sizable segment of their effort, consciously or unconsciously, is directed toward preparing students to pass examinations rather than challenging them in the fascinating alchemy of extracting medical wisdom from scientific facts. Little wonder that students are prone to lose interest in their teachers.

This paper is not presented as an argument against comprehensive major examinations or against a system of external examiners, but rather as an indictment against their relative significance in an over-all assessment of the medical student. In the context of our objectives in medical education and the criteria of judgment in the assessment of progress toward these objectives, it would appear that the instruments of measurement currently in use are in gross error. Judging from the content and administration of examinations, one is led to the conclusion that the objectives of these efforts are to produce a physician crammed with scientific facts, a receptacle of knowledge; and that the criterion of judgment is the ability of the student to produce these facts on demand. Unfortunately, this places the student on about the same level as a text book, where these same facts are arranged usually in a little more orderly fashion than in the student's mind. It is the considered opinion of the author that this serious error, if permitted to continue unchecked, will influence detrimentally the stature of present and future graduates of our medical colleges. India at the moment stands at a peculiarly advantageous position in the general field of education. Hers is the challenge, in this day of progressive change, to select the best from the educational experience not only of her own

culture but also from other lands as well. These concepts then can be molded into an academic form best suited to her own purpose.

The argument presented by some in defense of external control of medical examinations, namely, that our medical colleges cannot be trusted to uphold academic standards, is not only invalid but a calumny as well. Although initially some medical colleges might take advantage of such academic freedom, they would not dare continue long on this renegade path, for it soon would lead to self destruction. It has been said that "by their fruits ye shall know them,"¹² and any institution which did not treasure the reputation of her graduates would soon lose her own reputation among the councils of medical educators.

Others have defended the present examination system as a protection against external pressures, political and otherwise, upon the administration of the medical college. Without denying the fact that pressures might increase in the face of a greater autonomy in examinations, surely this argument carries little weight with the great majority of our educationists who are building toward true academic stature in medical education. There are countries known for their leadership in medicine which have no external examiners, and the responsibility for examinations rests solely with the faculty within the institution. The author does not advocate the total application of such a system in India but rather wishes by the statement of this fact to refute the assertion that external control is essential to progress in our medical colleges.

Let us re-examine our instruments measuring student progress in medicine in the light of objectives and criteria submitted earlier in this presentation. Under such terms of reference a cer-

¹² Gospel According to St. Matthew, Chapter 7, Verse 20.

tain core of medical knowledge must be established as a foundation; however, a premium should be placed on the student's interpretive and creative ability and his understanding of the scientific approach to problems. The determination of accomplishment in this context does not lend itself to measurement by three major and critical examinations in great part applied and assessed by external faculty. A far more accurate evaluation of the student can be made through frequent tests and continuous observations by the faculty directly responsible for instruction. Such a procedure places the major burden of assessment where it belongs and frees the student and teacher alike from the psychological hazards and restrictions of examinations by crises. An academic environment of this type also places the student/teacher relationship in a healthful perspective.

SUMMARY

The evaluation of the progress of medical students by major examinations in crises adversely influences the study motivations of students and the teaching techniques of faculty. Such a system places a premium on the quantitative memorization of facts and discourages individual creativity and scientific freedom of thought. The teacher working under such a relatively inflexible technique of assessment controlled for the most part by extramural authorities tends to move in the direction of the purely didactic rather than the experimental in medical education.

Correction of this situation is critical to the future of medicine in India and can be accomplished by placing the major responsibility for the assessment of the progress of students in the hands of the faculty directly concerned with their teaching, and by applying examinations as a continuum of evaluating tests and observations in the day-to-day activities of the student.

A Classroom Demonstration of Some Pharmacological Properties of Antibiotics*

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The pharmacology of antibiotics and chemotherapeutic agents has been a relatively neglected area. A laboratory to demonstrate some of the so-called side effects of a few of the more commonly used antibiotics is described in this paper. Such demonstrations are intended for presentation to medical and paramedical students. We try to emphasize in this laboratory that chemotherapeutic agents can affect the patient as well as the infecting microorganism.

The experimental methods used in these demonstrations require a minimum of equipment. The laboratory demonstrates the effects of antibiotics (a) in decreasing neuromuscular transmission, (b) in increasing the neuromuscular blocking action of ether, (c) in depressing the cardiovascular system of rabbits, (d) in producing irritation of the thoracic mucosa of rabbits, and (e) in producing convulsions when introduced into the cerebral spinal fluid.

I. PURPOSE: TO DEMONSTRATE THE NEURO-MUSCULAR BLOCKING PROPERTIES OF ANTIBIOTICS

Pittinger *et al.* have demonstrated the potential dangers associated with the administration of certain antibiotics during anesthesia and surgery (7-9). The neuromuscular site of action of antibiotics can

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easily be shown with the use of the sciatic nerve-gastrocnemius muscle preparation in the rabbit. New Zealand strain rabbits were not used in these demonstrations because of their extreme depression by the barbiturates that we used. The experiment and the surgical preparation of the animals are performed under phenobarbital sodium anesthesia, 200 mg/kg. The distal end of the severed sciatic nerve is stimulated with a Grass Model S4-B stimulator or similar apparatus. A supramaximal, tetanic stimulus ($f=250/\text{sec.}$) of 0.2 seconds' duration is used, and the nerve is stimulated every 5 seconds. Contractions of the gastrocnemius muscle are recorded on a smoked drum, with the use of an isometric lever. The drugs used are (a) penicillin G potassium, (b) streptomycin sulfate, (c) kanamycin sulfate, (d) neomycin sulfate, and (e) neostigmine methylsulfate.

After a control recording is established 100,000 units of penicillin is administered intravenously (I.V.). There is no change, indicating that penicillin has no effect on the myoneural junction at this dose. Next, either streptomycin sulfate (100 mg/kg) or neomycin sulfate (50 mg/kg) is administered I.V. The blocking effect as seen in Figure 1 was demonstrated by Timmerman *et al.* (12). This depression is then antagonized by an injection of neostigmine methylsulfate (50 $\mu\text{g}/\text{kg}$) I.V. (Figure 1). A choice of two antibiotics is offered to allow a demon-

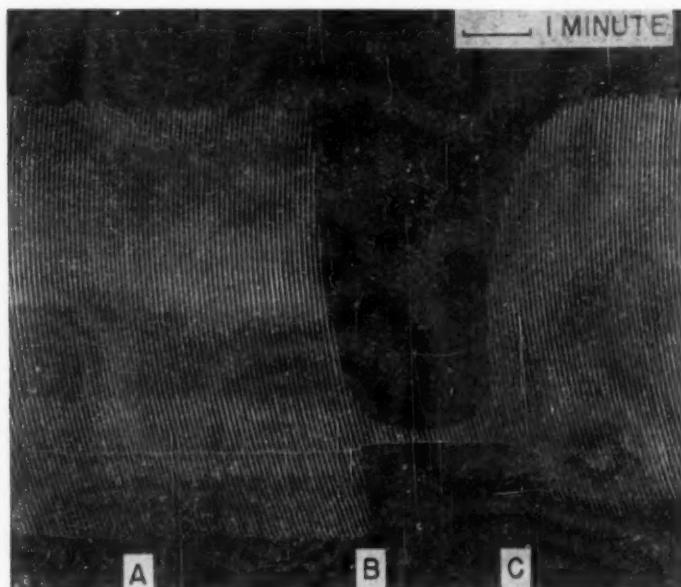


FIG. 1.—Effect of penicillin G potassium and neomycin sulfate on the sciatic nerve-gastrocnemius muscle preparation and the effect of neostigmine methylsulfate upon neuromuscular blockade caused by neomycin sulfate. *A*, Penicillin G potassium, 100,000 units; *B*, neomycin sulfate, 50 mg/kg; *C*, neostigmine methylsulfate, 50 μ g/kg.

stration of the variation in effects by such agents. Given in equal doses of 25 mg/kg, neomycin sulfate has been reported to induce approximately 40 per cent blockade as compared with approximately 10 per cent with streptomycin sulfate (12). The action of neostigmine in reversing the neuromuscular blockade points to the possibility of a nondepolarizing type of block by these antibiotics.

For the second part of this demonstra-

tion another rabbit is used. Kanamycin sulfate (200 mg/kg) is injected I.V., and time is allowed for a maximal response to be noted. Then neostigmine methylsulfate (50 μ g/kg) is again administered. Frequently, kanamycin blockade is increased by neostigmine methylsulfate, indicating a blocking action unlike that produced by streptomycin or neomycin. Results obtained in our laboratory are summarized in Table 1.

TABLE 1
NEUROMUSCULAR BLOCKING PROPERTIES OF ANTIBIOTICS

Antibiotic	Dose	Neuromuscular block	Reversed by neostigmine (50 μ g/kg)
Penicillin	100,000 units	No
Streptomycin	100 mg/kg	Yes	Yes
Neomycin	50 mg/kg	Yes	Yes
Kanamycin	200 mg/kg	Yes	No

II. PURPOSE: TO DEMONSTRATE THE
INCREASE IN THE NEUROMUSCULAR
BLOCKING ACTION OF ETHER BY
SOME ANTIBIOTICS

A simple method for demonstrating the actions of some antibiotics in increasing the neuromuscular blocking effects of ether is to anesthetize rats with ether for 30 minutes and then inject these same animals with various antibiotics. The anesthesia can be accomplished by the use of bell jars (2-liter) into which is added 2 ml. of ether and a gauze packet of a CO_2 absorbent such as NaOH and $\text{Ca}(\text{OH})_2$. Three animals are used for each antibiotic; one for the ether control, one for drug control, and one for ether plus drug. Antibiotics used are: (a) streptomycin sulfate, 250 mg/kg, (b) dihydrostreptomycin sulfate, 600 mg/kg, (c) neomycin sulfate, 300 mg/kg, and (d) penicillin G potassium, 1,000,000 units/kg. Injections are made intramuscularly. Results obtained with rats weighing 150-300 gm. are shown in Table 2. Doses are adjusted in such a way that death of the animal indicated the combined effects. These results confirm work done by Pridgeon (10), Timmerman *et al.* (12), and Pittenger *et al.* (9).

III. PURPOSE: TO DEMONSTRATE THE
EFFECTS OF ANTIBIOTICS ON THE
CARDIOVASCULAR SYSTEM

A. *The isolated rabbit heart.*—The isolated heart preparation of Langendorf (2) is used to demonstrate these effects. Such

actions may have some relation to the cardiovascular toxicity of chloramphenicol in the neonate and the effects of streptomycin observed clinically on blood pressure (3, 5, 6). Contractions of the isolated heart are recorded on a smoked drum. A typical experimental record is shown in Figure 2. Locke-Ringer solution for the isolated heart is used. Drugs and dosage used in this demonstration are: (a) chloramphenicol succinate, 40 mg. and 80 mg. total dose, (b) streptomycin sulfate, 10 mg. and 20 mg. total dose, and (c) tetracycline HCl, 10 mg. total dose. All drugs are made up to a 1-ml. total volume per dose with the Ringer solution and are kept at the temperature of the perfusing solution until administered through the side arm tube. The order of drug administration is unimportant, except that tetracycline should be administered last, since it irreversibly stops the heart. These actions have been reported by Leaders *et al.* (4) and Swain *et al.* (11).

B. *To demonstrate the effects of antibiotics on the blood pressure of anesthetized rabbits.*—Rabbits are anesthetized with phenobarbital sodium. The femoral artery is cannulated, and blood pressure is recorded. The jugular vein is used for infusion of the antibiotic solutions from a burette. Tetracycline HCl, streptomycin sulfate, dihydrostreptomycin sulfate, chloramphenicol succinate, and/or oleandomycin phosphate are dissolved in isotonic saline solution in concentrations of 10 mg/cc. These antibiotics are infused at the rate of 2 ml/

TABLE 2
ANTIBIOTIC POTENTIATION OF THE NEUROMUSCULAR BLOCKING ACTION
OF ETHER IN RATS

ANTIBIOTIC	DOSE	NUMBER OF DEAD ANIMALS		
		ANTIBIOTIC	ETHER	ETHER + ANTIBIOTIC
Penicillin	1,000,000 units	None	None	None
Streptomycin	250 mg/kg	None	None	All
Dihydrostreptomycin	600 mg/kg	None	None	All
Neomycin	300 mg/kg	None	None	All

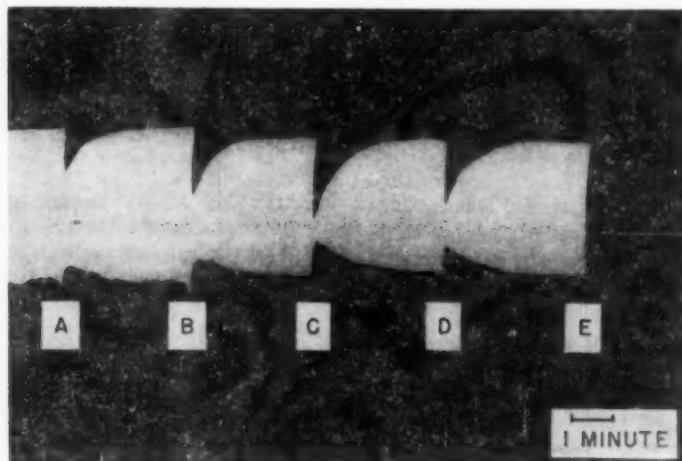


FIG. 2.—Effect of antibiotics on the isolated heart preparation. *A*, chloramphenicol succinate, 40 mg.; *B*, chloramphenicol succinate, 80 mg.; *C*, streptomycin sulfate, 20 mg.; *D*, streptomycin sulfate, 10 mg.; *E*, tetracycline HCl, 10 mg.

min. Respiration must be supported, since respiratory failure is noted prior to the maximum blood pressure fall. In our experiments, minimal blood pressures were observed within 15-30 minutes after beginning the infusion of drug. A new rabbit is necessary for each antibiotic demonstrated. This hypotensive effect has been reported by Pittenger and Long (8) and Leaders *et al.* (3).

IV. PURPOSE: TO SHOW ANTIBIOTIC IRRITATION

A possible method for screening antibiotics for irritating properties is the effect seen following intrathoracic injection of the drug in rabbits. "Irritation" is interpreted as inflammation of the lungs and/or thoracic mucosa, accumulation of fluid in the pleural cavity, and/or petechial hemorrhage of the lungs. Tetracycline HCl, 300 mg., erythromycin (free base), 300 mg., penicillin 0 sodium (Cer-O-Cillin Sodium, Upjohn), 500,000 units, chloramphenicol (free base), 300 mg., and a saline solution control are used.

All antibiotics are diluted to a total volume of 3 ml. with saline solution. It is important that a penicillin salt other than the potassium salt be used. Intrathoracic injection of the potassium salt is lethal. Erythromycin and chloramphenicol must be administered as the free base for optimal results. In our experiments the newer ester preparations of these two antibiotics did not show this irritation. Injections are made 5 hours before the laboratory period. Immediately prior to the demonstration the animals are sacrificed, and the thoracic cavity is opened at the midline. One must be careful to cause as little bleeding as possible. The students may then observe the difference between the animals receiving tetracycline, erythromycin, and chloramphenicol which are irritating and the saline and penicillin which are not. Of the drugs used, tetracycline has consistently been the most irritating. Chloramphenicol and erythromycin show about equal effects but less than tetracycline. These results thus correlate generally with clinical experience.

V. PURPOSE: TO DEMONSTRATE THE EFFECT
OF PENICILLIN WHEN INJECTED INTO
THE CEREBRAL SPINAL FLUID

The text "Pharmacology in Medicine," edited by Drill, points out that penicillin injected intrathecally in man and laboratory animals may produce convulsions (1). To show this, penicillin G potassium, 10,000 units, in 0.1 ml. of isotonic saline is injected slowly into the cisterna magna of an unanesthetized rabbit. A convulsive seizure will be produced by this route of administration. An equal volume of saline or isotonic KCl solution alone injected in the same way will have little if any noticeable effect.

In summary, it should be noted that doses and routes of administration used in these demonstrations are not necessarily those used clinically in either humans or animals. The purpose, however, is to formulate a laboratory which is easily reproducible and which demonstrates some of the observed side effects of some antibiotics.

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The Test of Diagnostic Skills*

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In a study entitled "A Technique for the Study of Problem Solving" (7) the author of the present article described a procedure for the experimental study of high mental processes with special reference to the clinical diagnostic problem. Since that time a considerable amount of research on the problem has been conducted at the Loyola Psychometric Laboratory. New forms of the test have been devised, new scoring procedures have been described (13, 14), and the application of the technique to fields other than medicine have been presented (3, 6, 16). The basic rationale of the Test of Diagnostic Skills has been used for the construction of PSI (Problem Solving and Information Apparatus) (5).

A considerable amount of interest has been shown recently by medical educators in the possibility of using the Test of Diagnostic Skills as an instrument for evaluating and training medical students. In the present report the results of research performed by the author of this report and his associates will be presented in the hope that this first presentation of the findings will be

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of help to those interested in medical education.

THE TEST OF DIAGNOSTIC SKILLS

The purpose of the test is to estimate how a medical student proceeds when diagnosing a clinical case. The subject is requested to reach a diagnosis by asking those questions that he considers pertinent. After being given some preliminary information about a specific case, i.e., Data Upon Admission and Chief Complaints, the subject is free to request the additional information. The Test itself consists of cards contained in flat pockets which partially overlap and are evenly arranged on a display folder. On the top edge of each of these cards a question that the examinee may ask is indicated. These include questions that he may wish to ask of a patient; the manipulative techniques he might wish to use; the diagnostic tests he might order, and so forth. By drawing a card and looking at the reverse side the subject gets information that is given in the form of verbal reports, laboratory analysis, x-ray films, etc. For instance for a question like "Chest X-Rays," the answer may be "Both lung fields normal. Marked calcification in the arch of the aorta," and so forth. The experimenter or the subject writes the number of each item as soon as it is chosen, or, if the cards are perforated, inserts them face down on a pin in the same order in which they are selected. By inspecting the pile of cards the experimenter knows the order in which they were requested (7).

Real cases of varied diagnostic diffi-

culty can be presented in this fashion. At the present time the author is preparing a variety of improved tests in which the findings obtained in the previous research will be considered. Experience acquired during these years has permitted us to build new forms of the test avoiding some of the weaknesses of the forms used up to the present time.

Before discussing the findings obtained by using the Test of Diagnostic Skills it is important to emphasize some of its main features. Since it is possible to study the process followed by a subject in diagnosing a case the technique has advantages and shows aspects of the diagnostic process that are entirely missed in the ordinary true-false or multiple-choice type of test. Indeed, it is possible to show that subjects who reach the same diagnosis may do so by following different processes. These processes may be easily characterized by inspecting the sequence in which questions are asked. Successful and nonsuccessful leads followed by different subjects are easily detected; exhaustiveness in exploring different hypotheses becomes evident; ability to obtain maximum information about the patient can be concretely demonstrated; and the ways in which this information is brought together to reach a final diagnosis may be shown. Thus, the dynamic aspect of the diagnostic process can be explored objectively and the instrument used to evaluate diagnostic ability and to train in diagnosis. In the following paragraphs we shall refer mostly to observations made when administering the test to groups of subjects at different levels of medical training.

Indeed, it is clear that the test is not identical to the clinical situation which can only be approximated by a testing device. However, the Test is similar to the type of situation encountered in clinical conferences, and we are fairly

certain that the Test of Diagnostic Skills is able to get nearer to the diagnostic ability of a subject than the tests more commonly used for this purpose.

SCORING PROCEDURES

The assumptions underlying the Test of Diagnostic Skills are very different from those used in ordinary mental tests (7, 9). To obtain reasonable scoring procedures it has been necessary to perform intensive and extensive research, some of which has already been published (13, 14). New approaches that will in all likelihood replace the ones followed until the present time are being developed at the Loyola Psychometric Laboratory.

Two main types of scores have been used: those that have to do with the number of questions asked and usefulness of these questions in terms of the final diagnosis, and those that are essentially concerned with the order in which the questions are made.

The following are the major scoring procedures:

a) The two forms of the test, A and B, used in this study contain, respectively, 56 and 59 items. For each subject it is possible to observe how many questions are asked until diagnosis of the case is reached. These questions may be divided into three types: those pertaining to Interview and History of the patient (Part I), those related to Physical Examination (Part II), and those concerned with Laboratory Procedures (Part III). The number of questions for each one of these parts as well as for the total can be obtained.

b) The ratio between the number of times that a given question has been asked and the number of subjects in the group can be taken as an indication of the utility of the particular question. This gives the utility index of each card. Obviously, utility indices will vary according to the group of subjects being

examined, but it is always possible to assign a utility index for each card in terms of the performance of a criterion group (physicians), or in terms of the groups of junior or senior medical students (10, 11).

c) The utility score is the average of the utility indices of the cards selected by the subject. This utility score can be calculated by utility indices derived in the various forms that have been indicated in the previous paragraphs. Several variations of this score have been described (10, 11).

d) Accuracy of the final diagnosis.

e) Relationship between the sequences followed by different subjects and average intercorrelation between the sequences followed by all the subjects in a given group. Novel ways for dealing with this problem (14) have been explored with highly satisfactory results (15). These will not be discussed in the present article.

f) Individual performance curves can be drawn to characterize the performance of each subject (4, 13). Some of the main results obtained following this procedure will be presented in the following paragraphs.

g) Entirely new scoring procedures that may be machine-scored are now being developed. This new approach allows for a precise characterization of the diagnostic process as a whole and at every discrete step. This method will be published in the near future.

SUBJECTS AND TESTS

Two forms of the Test of Diagnostic Skills (A and B) were administered to approximately 100 junior medical students, 230 senior medical students, and 50 physicians. These samples were drawn from four medical schools in the Middle-West and one Eastern Medical School.

Before deciding on the forms of the test to be used, experimentation was performed to investigate whether cases

that were specially prepared, as compared with those that represented true medical cases, gave better results. The findings indicated that real clinical cases should be used rather than specially prepared cases. The Tests included all the information given in the corresponding medical history (11).

A shortened form of the test was prepared. This did not include the physical examination data that were given to the students prior to the administration of the test. The experimental results indicated that this form of the test is far less satisfactory than the one including all the information and consequently was dropped from our study (11).

The Test of Diagnostic Skills was administered in group form to both students and physicians. In rare situations it was administered individually. The duration of the testing session was typically from 30 to 40 minutes. Some subjects were able to complete the test in as little as 10 minutes. Since this is not a time test, time to completion is not of interest.

RESULTS

Number of cards.—Junior students selected more cards than senior students, who in turn selected more than the physicians in both Tests A and B (1).

Whereas the number of items referring to Part II and Part III of the test showed little difference between these groups, items related to history and interview (Part I) sharply separate the groups. This seems to be in agreement with the suggestion commonly made that, in general, the most significant part of a diagnosis is related to the interview section. If this is so, techniques should be developed in order to (a) study in greater detail the characteristics of the medical interview and (b) train students more adequately in this area of the diagnostic process.

Individual variations in the number of

cards selected indicates that senior students are more similar among themselves than junior students or physicians (2).

A summary study of these findings provides evidence "that the most striking change in the diagnostic process with increased clinical experience is found in the interview phase." It seems that students at the beginning of their medical training vary widely in their approach to the diagnostic problem; hence, the heterogeneity of the junior students. The senior students show more uniformity. With greater gain in clinical experience, physicians follow a more discriminative approach (2).

Utility indices and performance curves.—The utility indices for the different cards of both tests A and B have been published elsewhere (11). Whereas some items show significant changes according to the level of the training of the group examined, others remain more constant. It is also clear that there are questions that are never asked by physicians which medical students may ask. Some of these differences are statistically significant and indicate that junior students ask questions that are often irrelevant or redundant, or that they may follow wrong clues. It is interesting to notice that this type of finding holds for students from different medical schools. Concrete information concerning these points has already been published (2, 12). The medical interpretation of these changes is of great interest and very revealing.

If these results are studied in relation to those presented in the previous section of this article it could be said that in teaching medicine it might be advisable to reach the level of homogeneity shown by the senior students in the shortest possible time. The Test of Diagnostic Skills could be used to improve this training and to evaluate it.

The utility index is in a way an indi-

cation of agreement of the members of a group concerning the usefulness of a given item. If utility indices are computed separately for groups of physicians from different medical schools it is found that they are very highly correlated. "These findings are a powerful indication that the performance of physicians from different schools, when taken as a group is, for a specified case highly similar" (1). This in turn indicates that the performance of these physicians can be confidently taken to define a criterion in terms of which students may be evaluated.

If the value of the utility indices of the cards selected by a given subject is cumulated following the sequence of the subject solving the test, a curve of performance can be readily obtained (13). These curves indicate how a subject is gaining information as he proceeds in his diagnostic process. By using this approach it has been possible to characterize types of performance, to discriminate between subjects, to indicate the influence of training and the way in which different diagnostic problems are solved by the same subject. By a variation of this procedure it has been possible to show the direct relationship existing between level of training and performance in the Test of Diagnostic Skills.

A typical example is given in Chart 1, where the limits of the ovoid indicate theoretically derived maximum and minimum performance curves. The curves *j* and *k* refer to the performance of two subjects taking the same test. Notice that subject *k* accumulates almost no information between questions 1 and 4. This plateau can be interpreted by knowing which are the questions that correspond to it.

Plateaus of this type are much more frequent in the performance of junior students than in the performance of senior students. It has been shown (4)

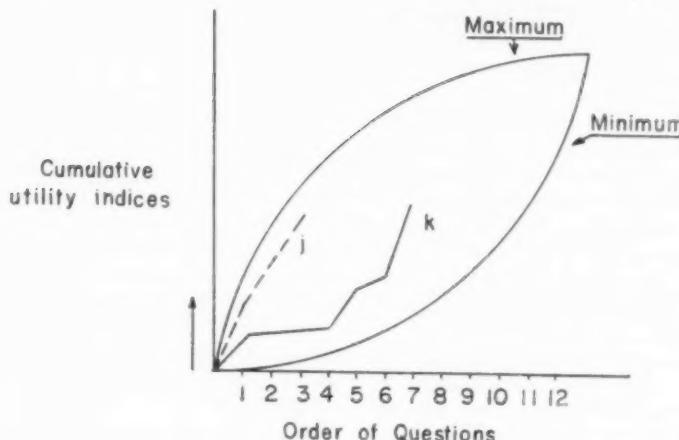


CHART 1

that if the same student is administered the same test at the junior and senior levels the plateaus tend to disappear as the level of training increases.

It is easy to see how an instructor may take advantage of these performance curves in order to improve the diagnostic ability of a student. It should be noticed that if this experimental information is interpreted with the results already mentioned it is relatively easy to estimate changes in performance and to obtain valuable clues to better methods of improving diagnostic ability.

Utility scores.—The utility score is the average of the utility indices of the cards selected by a subject. A higher utility score indicates that the average of the utility indices selected by a subject is higher than when the utility scores are low.

By use of the utility indices of the physicians to evaluate the utility scores of the junior and senior students, it is found that the latter give higher values than the former (2), and that this is mostly due to questions related to Part I of the test. On the whole this seems to

indicate that the agreement between seniors and physicians is greater than the agreement between juniors and physicians. Haley (4) found that the same effect also operates at the individual level. There is no reason why the evaluation of students cannot be made in terms of the group to which they belong. This has been done for all our subjects, and the results have already been published (2).

It has also been shown, for a limited group of subjects, that the utility scores are positively correlated with some grades in medical school, notably Surgery comprehensive, Average comprehensive, Average grade for the first two years, and Average clinical grade (8). These correlations can be considerably improved when variation of the utility score is used. This variation mainly consists in using a difference score based on the irrelevant questions asked by students. Irrelevant questions are those that are never or very seldom asked by physicians.

Scores based on sequence of questions.—A basic part of the rationale of the

Test of Diagnostic Skills assumes that the same question has different significance, in terms of the diagnostic process, depending on when it is asked during the process. Thus, two subjects asking the same questions but in reverse order, to make the contrast as striking as possible, should give very different results.

In order to solve this difficult problem several approaches have been followed. Since these procedures are highly technical they will not be discussed in the present study. It is clear that one of the methods, Pattern Analysis, gives information that cannot be obtained by any other known method for scoring tests. The value of changes in sequence can be stated clearly. Since the method can be processed for electronic computers, it is expected that it may be used by those interested in the Test of Diagnostic Skills.

During the last few months a new scoring system that represents a radical improvement over all the previous procedures mentioned in this article and in publications related to this test has been developed. This new approach gives a quantitative and a qualitative statement which serves to characterize the performance of each subject. The method seems to be readily adaptable to electronic computers. The rationale of this new methodological approach will be published shortly.

SUMMARY

The Test of Diagnostic Skills is an instrument specially devised to appraise clinical diagnostic ability. The content of the Test is a real clinical case. The rationale of the Test can be easily extended to the study of high mental processes in fields other than medicine.

By the use of this Test it is possible to evaluate: (a) information requested by medical students or physicians when diagnosing a clinical case, (b) order in which this information is requested, (c)

exploration of clues and verification of diagnostic hypotheses, (d) accuracy of the final diagnosis.

Because of the assumptions basic to the Test of Diagnostic Skills a new scoring system had to be developed. The Test of Diagnostic Skills differentiates between levels of medical training (junior students, senior students, and physicians). It can be used to evaluate students and as an aid in training in diagnostic procedures.

The study of performance curves has shown how students improve their diagnostic ability with increased clinical experience.

The Test of Diagnostic Skills provides information not obtainable by using the ordinary true-false or multiple-choice type of test.

The results given in this article refer to several studies conducted during the last five years in five different medical schools. New improved forms of the Test are being prepared and will be used to evaluate medical students and to improve their diagnostic training. In these new forms the results of previous experimentation have been introduced.

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A New Program in Medical Education at Northwestern University

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In the fall of 1961, Northwestern inaugurates an integrated program of medical education for a pilot group of highly talented students entering from high school. Those accepted into the program will be given the opportunity to complete work for the M.D. degree in a minimum period of 6 years. The first 2 years will be spent on the Evanston campus of the University and the last 4 years in the Medical School in Chicago.

The formulation of this program was the final result of a series of deliberations which began in 1956 when Dean Richard H. Young of the Medical School asked President Miller to appoint a Committee on Medical Education to consider possibilities for improving the integration of the premedical and medical phases of the physician's education. The committee had representation from the College of Liberal Arts and the Medical School. The members from the College were Irving Klotz, Professor of Chemistry and J. Lyndon Shanley, Associate Dean of the College of Liberal Arts; from the Medical School, George Yacorzynski, Professor of Psychology in the Department of Neurology and Psychiatry, Ralph E. Dokkart, Associate Professor of Medicine, and John A. D. Cooper, Associate Dean of the Medical School. Chairman of the

Committee was Moody E. Prior, Dean of the Graduate School. During the period of study other members of the University faculty from the College and the Medical School were consulted and brought into the discussion. Visits were made to other colleges and universities to gain firsthand information on educational innovations which interested the Committee, and advice was sought from individual medical educators.

THE BACKGROUND

The considerations which occasioned this study were, in the largest sense, those which have provided the incentive for much of the questioning and revision which have characterized academic medicine in recent years. The last few decades have witnessed a rapidly expanding accumulation of knowledge in medicine and extraordinary progress in the sciences related to medicine. In consequence, professional education for medicine has become increasing compartmentalized, and the total period of training for a physician has become inordinately long. There have been changes, too, in the modern concept of the role of the physician in the maintenance of health and the prevention as well as cure of disease. These and other aspects of the problem have called for careful reconsideration of the established programs leading to the M.D. degree, and it is not an exaggeration to say that at no time since the Flexner report has there been such anxious reflection among medical educators and such fresh and bold reconsiderations of medical education.

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‡ Director of the Graduate School and Professor of English, Northwestern University.

The Northwestern Committee focused its attention on a special aspect of the general problem, the relationship of the undergraduate to the professional portion of the medical course. The starting point of its deliberations was the supposition that, in the light of the magnitude and complexity of the modern developments in medicine, confining attention to the traditional 4 years of medical school was too limited. The prevailing pattern of medical education calls for 3 or 4 years in college, consisting of a general liberal arts program with certain required or recommended courses which are the core of the premedical training, followed by admission to a medical school. There is only a loose and general relevance of the first period to the second—in fact, many medical educators question the desirability or value of some of the specific demands of the usual premedical program while insisting on the great value of the general education thus acquired. From the student's point of view, this period of study has come to assume the aspect of a testing ground for entrance to a medical school, and, while he may concede the value of much of his study, he also senses a sharp separation between the first and second phase of his education—assuming that he is ever allowed to undertake the second. This division is intensified by the physical separation of many medical schools from the university campus. The desirable features of the existing pattern are the gain in breadth which the college training provide for the future physician and the foundation which it gives him in the sciences. There is merit also in its flexibility, which allows a student to branch off into other programs of study—either through change in motivation or failure to enter medical school—some of which are closely related and relevant to medicine itself. The Committee recognized these advantages and the desirability of

preserving them as far as possible in any new program. It raised the question, however, of whether it was not time to reconsider medical education as a total sequence and whether, with such a shift in point of view, a more effective total program could not be effected which might bring about genuine improvements in the education of a physician without necessarily losing the essential advantages of the prevailing pattern.

With these considerations in mind, it adopted at the outset the following statement of its aims and purpose:

"The Committee is charged with the responsibility of exploring the possibility of developing a program of medical education which will (1) eliminate the present sharp division between premedical and medical education, (2) introduce at the College level materials of study that have a more direct bearing on the study of medicine than are available in the conventional pre-medical program, (3) continue into the professional curriculum relevant studies which are at present presumed to be available only in the College curriculum and which are not directly related to education for medicine, and (4) if possible reduce the length of time required for the completion of the course of study. The end in view would be a continuous and coordinated program which would be thought of as beginning with the freshman year of college and would never lose sight of the total educational needs of the prospective medical practitioner or advanced student in the medical sciences.

"In exploring the possibilities of such a program the Committee must keep in mind certain limiting considerations. (1) The program must allow sufficient flexibility during the initial years so that the student may branch out without penalty into (a) any one of several areas of medical study for which he is best fitted, whether medical practice, teaching or research; or (b) into any one of the several possible scientific specialties; or (c) even, with possibly some loss of time, into other branches of learning. (2) The program must be designed so that students may be recruited into the study of

medicine from schools other than Northwestern."

To the accomplishment of these aims, certain impediments were evident from the beginning. Under present conditions, a continuous medical program of the kind contemplated by the Committee would be possible only within the same institution; yet some of the most promising students now enter the medical school from many other colleges and universities, and this would certainly continue to be the case. In addition, the physical separation of the medical school from the rest of the university precluded some interesting possibilities for integration. It appeared more fruitful, however, to focus at first on educational issues rather than on practical obstacles and to devise adaptations to the practical demands as they became relevant. What are the aims of a program of medical education? What is the contribution of the disciplines not directly a part of the strictly professional training? What sequence of courses, what degree of emphasis, what principle of selection among the competing forms of knowledge could best meet the needs of the medical man of our day? These were the questions of first importance.

The objective of a basic medical education is, simply, to make a good physician. In view of the range of general and specialized professional activities which are open to a man with medical training, it is more accurate to say that a basic medical education must give the student a foundation on which he can build for a wide variety of opportunities which medicine offers in patient care, teaching, and research. Mastery of the total learning for a profession has never been more than a remotely attainable goal, but in the present state of knowledge it is more impossible than ever. The formal medical curriculum can serve only as a brief and intensive part of the total continuing educational effort of the in-

dividual. The base on which the student erects his education for medicine must be the understanding of the relevant disciplines not as collections of facts and formulas but as ways of thinking with organized structures of their own. Emphasis must be placed on a fundamental core of information and not on encyclopedic erudition, on the integration of seemingly unrelated facts, on the development of critical thought and observation, on the appreciation of scientific method. If the course of study is successful, it will develop in the student an inquisitive attitude and a lasting desire for building on the foundations of his education. This approach to the objectives of medical education is especially appropriate for our times, but it is not new. William Welch's expression of it in 1910 can stand a half century later with almost no change:

"It is impossible to impart the entire content of medical and surgical science to the student. One cannot even impart the content of a single subject in the curriculum. The utmost to be expected is to give the student a fair knowledge of the principles of the fundamental subjects of medicine, and a power to use the instruments and methods of his profession; to give him the right attitude towards his patients and his fellow-members in the profession and above all to put him in a position to carry on the education which he has only begun in medical school. Our aim, therefore, should be to put him in a situation to complete his education through the remainder of his life. With that point of view in mind, we cannot hope, therefore, to teach the student the entire contents of the science of medicine. The student cannot go out a trained practitioner, a trained pathologist, a trained anatomist or a surgeon. Looked at from that point of view of knowledge alone, he has only a smattering. The training of his powers and methods of study are the important things. He should be put in a position to continue his own education."

This general approach is proper to the total program, including that portion

which is now loosely assigned to the premedical phase of the students' education. The relevance of the premedical studies now generally taken for granted is a matter that calls for serious reconsideration. Many justifications can be offered for the various disciplines that constitute the established parts of a liberal education, and experience and principle have accorded them an established place in our educational system. However, the demands of an integrated medical program require that we question all established practices and even the sacredness of the 4-year organization of the college experience. In determining the best course of study for medicine, the first consideration must be the production of the best possible medical practitioner and scientist. The qualifications for a good medical man are demanding, and in meeting the educational requirements for this product we may well come close to meeting the general ideals of educators, but the thinking about the proper educational program for medicine should not be confused and diverted by the intrusion of the more general consideration of what constitutes a well educated man or what is best suited to the development of the well rounded individual or the cultivated citizen. The justification of what we will require of the medical student in an integrated program must be its clear relevance to the first-rate professional product which we hope to create.

THE NATURAL SCIENCES

The practice of medicine depends on the sciences. We can, therefore, take for granted the importance of science in medicine; we cannot, however, take for granted the traditional content and order of the sciences in the medical curriculum. Great developments have taken place in recent years in the sciences, and the growth of scientific information challenges the ability of scientists to keep

up with the literature even in restricted specialized areas. At the same time, the biological and medical sciences have emerged from their state of morphology and description to the quantitation of living systems. Not only are the fundamental physical sciences providing new approaches for the biologist, but biology is developing new concepts from fundamental considerations of the highly organized components in living systems. The medical student's education in chemistry must now be extended from an understanding of general and organic chemistry to include aspects of physical chemistry, and especially the areas of kinetics, equilibria, and energetics, for a better appreciation of the dynamic state of the living organism. A similar extension needs to be made in the training in physics. Striking progress has been made in the analysis of complex interacting systems in the body through the application of fundamental physical and mathematical principles. The power which the calculus and differential equations provide in understanding multiple variable systems should also be available to the medical student. The success which has been achieved in understanding quantitative relations between parameters formerly related only with great difficulty demands a better foundation in the physical and mathematical approaches which are increasingly bringing order in many areas of medicine.

In view of these changes in science and in medicine it is no longer desirable to leave the scientific training of the physician to chance and miscellaneous selection unless we wish to overwhelm him with erudition and have no concern for the length of the educational period. There is no doubt that biology, chemistry, mathematics, and physics are essential to any medical education; there is also little doubt that at present these courses are organized neither in content nor in

sequence in a fashion which is most effective for medical training, and there is even some question whether they are ideal from the point of view of the best scientific education. Each elementary course in these sciences is currently presented on the assumption that the student has had no background in any other science, that he may not be further exposed to this field, and, of course, that he may not be oriented toward medicine. For the medical student, these assumptions produce courses which do not make the most effective use of his time. A marked improvement can be achieved merely by the simple expedient of arranging these science courses into a prescribed order. For example, if every student in a basic biology course had previously completed a college course in chemistry, no time need be spent during the course introducing the simple elements of chemistry; moreover, chemical questions could be discussed in a much more rigorous and effective fashion, and the innovations of modern biology could be more extensively introduced. Likewise, if every student had a few of the basic ideas of trigonometry and calculus among his logical tools, the teaching of physical principles could be carried out in a much less cumbersome and elementary way.

THE SOCIAL SCIENCES

The sciences dealing with man and his social relationships have been experiencing something of the same factual and theoretical enlargement as the physical and biological sciences, and they have something to offer to the medical student both directly and indirectly. The educational system to which the physician is exposed should allow him to gain knowledge and information provided by the social sciences so that he can apply the insights thus acquired to his professional dealings with people no matter what his specialty might be. The physician does

not treat a disease, but rather a patient with a disease who exists within an environment with a family, a source of livelihood, and some niche in the society of his community. The object of teaching the social sciences in an integrated medical course would be to make available concepts by means of which the student can understand the effect of psychological and social factors on the occurrence of illness and at the same time appreciate the impact of disease upon a patient or family. He would be provided with the insights and tools available to help him perceive the patient within the totality of a given situation and to treat him not alone from the standpoint of a given disease entity.

The need to reorient medical education stems not only from the accumulation of new knowledge and its increasing fragmentation in the course of study but also from the very nature of the philosophical reorientation of the times. The understanding of the social and psychological forces which affect his patient as he perceives him from the point of view of his particular medical specialty may also influence the physician's notion of his role in the community of men. The medical student in training is taught, and rightfully so, to value independence of thought and creativity. Most students eventually commit themselves to a specialized branch of medicine which will require additional concentration in one specific field. The very virtues of the medical student's training, however, tend to make him an alienated and isolated individual. The physician works for the health of his patients, but not necessarily in the exact social sense of working with someone. There is value, therefore, in any aspect of his education which helps to minimize his isolation. It is possible that the need to recognize the social and psychological factors in the management of the patient may have an influ-

ence upon the attitudes of the physician as an individual and encourage an understanding of the broad complex of forces around him as they affect not only the people with whom he is dealing as patients but also himself.

THE HUMANITIES

The place of the humanities in medical education has usually been defended on the grounds of breadth and the cultural needs of the physician as an individual. It is not necessary, however, to become involved in disputes concerning the properties of a well educated man and the personal needs of the physician in order to conclude that the humanities have a place in a course of study for medical men and to determine what that place should be. From the most strictly utilitarian point of view, the humanities, and more specifically English, serve an important function in helping to cultivate the student's ability in communication of thoughts and ideas. There can be little argument with the importance of this ability in a profession which is so largely dependent on interpersonal relationships and the necessity for accurate and persuasive communication. However, beyond this, the humanities have, in the broadest sense, an important service to perform in the education of the physician.

The sciences by their nature call for the formulation of generalizations which account for all cases of a particular phenomenon and predict with accuracy the conduct of future instances falling within a given category of events. Social sciences today are conducted increasingly on the assumption that the aims and methods of the natural sciences can be made to apply to these fields of study. On this assumption, the social sciences must necessarily imitate the impersonality of natural science, its generalizing properties, and, especially, its indifference to the definition of human ends or the means to be used in accomplishing

these ends. For any given individual human being, however, existence has meaning only as he can formulate and decide among the possible ends to which he can direct his energies and the means he will employ in trying to encompass them. These considerations are of the essence in the humanities. In literature, for instance, the subject of interest is an individual human experience viewed within a particular scheme of events and values. Literature, moreover, has the capacity to create sympathy and understanding even where it does not compel conviction, so that the varieties of human thought and feeling and the varieties of ways in which particular men react to the contingencies of their lives can be made to excite response and understanding over a wide range of values.

The object of study of medical science is admittedly not simple chemical and physical phenomena but the human being. The physical makeup of this being is the province of the natural sciences; his aggregate responses as part of a social mechanism are the province of the social sciences. In none of the branches of these areas of study is the uniqueness of the individual man the center of interest except perhaps psychiatry, nor the questions of human ends and means. The humanities have the property of considering the problems of value and choice, and of isolating unique experiences in thought, conduct, and feeling. They preserve, therefore, an interest in the individual human experience and promote a concern for our common humanity.

THE FIRST TWO YEARS

The undergraduate program which began to emerge from these considerations called, first of all, for a radical revision of the scientific curriculum for the undergraduate years. It became apparent that for properly qualified students an improved scientific training for medical

study could be arranged within the first 2 years without seriously interfering with courses in the social sciences and humanities during this time, and that in scientific background at least the student would be well prepared to undertake the courses in the medical school. It was also apparent, however, that such a course of study would be demanding, that it would require unusually well prepared high school graduates, and that these students would have to begin the program in the freshman year. The Committee decided that there could be no total solution. Such a continuous program of medical study could be designed only for a limited number—probably 25 talented students who, on the basis of their high school preparation, could qualify for advanced work in the physical sciences, mathematics, and possibly the humanities. The program finally designed for these students will accept students from high school, and can lead to the M.D. degree in 6 years. Students will be selected from among talented high school seniors who can present honors work in English and mathematics. In addition to a 4-year sequence in these subjects, they will be expected to have completed chemistry and at least 2 years of foreign language. They will be expected to present high scores on the College Examination Board achievement tests in advanced composition, mathematics, and chemistry, and special placement tests may be required of some before admission. Since they will be reviewed for admission both by the Medical School as well as the admissions officer of the College, they will have virtually achieved admission to the Medical School as college freshmen. They will be relieved, therefore, of the anxiety of demonstrating their qualification for medical study for one or another medical school and can approach their years in college not as a contest for achieving their wish to study medicine

but as part of a continuous program which will lead in 6 years to the M.D. and which, hopefully, will not be impoverished for having gained at least 1 year.

These students will spend the first 2 years in the College of Liberal Arts on the Evanston campus. One-half of the program will be in the sciences, in courses which are completely redesigned for this purpose. During the first year the science courses will be physics and chemistry. The first of these will be a combined physics and mathematics course which would approach physics from the viewpoint of the Holton text developed at Harvard and in which calculus would be taught with physics. Concurrent with physics and related to it will be a course in general chemistry. This course would build on the knowledge gained by the student in high school chemistry, and it would cover material from both organic and inorganic chemistry. A course somewhat on this order is already in effect for a special group of freshmen students in the University, and experience indicates that this approach furnishes an excellent background in chemistry for qualified students. During the second year the course in chemistry would continue, with the emphasis directed toward aspects of physical chemistry which are of interest in biological systems and toward the special organic chemistry of compounds of biological importance. The course in biology will be given during the second year rather than the first, since this arrangement makes it possible to take advantage of the material already derived from the courses in physics and chemistry. Biology can be presented in a more advanced and sophisticated approach, with emphasis directed toward quantitative aspects of the subject. Evolution, developmental biology, and general physiology will be given prominence, and descriptive biol-

ogy and classification will be greatly reduced.

The other half of the student's course work during the first 2 years will be devoted to the arts, humanities, and behavioral sciences. It is expected that the high school preparation of many of these students will qualify them for advanced level work in English and in a foreign language. The only other course required will be an interdisciplinary course in the behavioral sciences, which has already been developed and is currently available and which considers the basic constructs and approaches of psychology, sociology, and anthropology.

The merits and the probable success of such a program cannot be considered apart from the quality and the preparation of the students who will be selected for it. The design of this program was influenced by the progress which has been made in many good high schools in providing college level and honors programs for talented students. Those who have had the advantage of such programs are in a position to undertake advanced work in one or more fields on entrance to college. For such students, the first 2 years of the integrated program would bring them to a higher level of academic accomplishment within 2 years than would be the case for the average college student who followed the courses usually available to him during the same period of time.

Although the Committee strongly believed that at the end of these 2 years the students who had successfully followed the program would be well prepared to enter the Medical School, it did not pretend that these 2 years were the equivalent of a bachelor's degree program, and it gave serious thought to the deficiencies which must be taken into account and if possible compensated for. On the scientific portion, the Committee was satisfied that the 2-year sequence was a consider-

able improvement over the scientific preparation of most students who enter medical school with the conventional pre-medical program. One problem which the Committee had to meet was the understandable reluctance of the College to provide courses of a service nature to the professional schools. The decision to adopt these new courses was partly due to the conviction of some of the scientific faculty that, from the standpoint of sciences themselves, the new courses might have something to offer to college students and that the experience of giving them might prove valuable in a broader sense as an experiment in education in science. Moreover, these courses will be only the foundation. The education in science will continue in the medical program, and it is expected that the later courses will be approached in the same spirit as those of the first 2 years. In the social sciences, the student will have the opportunity to continue after the first interdisciplinary course by electives during the second year. However, in any event, study of the behavioral sciences will not end with the first 2 years, since all modern medical programs of study acknowledge the importance of the behavioral sciences and make provision for advanced study in them. In one area, however, the Committee recognized a deficiency for which there was no later provision. This was in the humanities (literature, the arts, history, philosophy). The graduates of a liberal arts college enjoyed a clear advantage here, especially when, in addition to the lack of later opportunity, we take into account the shortness of the stay in college of the students in the new program and their relative youth at the end of the 2-year portion of the program. However, in the Committee's thinking there was no irrevocable separation between the parts of the total six-year program, and it considered the possibility of remedying

this defect in the program by allowing for studies in the humanities after the first 2 years. It was apparent that the third and fourth year would not allow for any additional courses beyond those required for the professional degree, and it was also apparent that, once these students became engrossed in their medical studies, the usual pattern of course discipline would be inappropriate. The program finally approved by the Committee provides for seminars to be held once a week during the fifth and sixth years of the program, to be offered in a variety of areas in the humanities and to be conducted as discussions. Attendance at the seminars will be required, but they will carry no credit, and no grades will be given. It is expected that the maturity of the students and the perspective acquired by their medical studies will make this the humanistic approach to experience more valuable to these students than it would have been at an earlier stage, and experience along these lines with informal groups of medical students in recent years has encouraged these convictions.

THE LAST FOUR YEARS

The major changes proposed in the program at the Medical School are for the first 2 years. In general, these changes will be along lines similar to those which governed the revision of the scientific curriculum of the first 2 years. Useful modifications of the medical curriculum have been introduced in recent years, but these have not in most instances gone far enough in building on previous knowledge, avoiding unnecessary repetition, placing emphasis on basic principles, and coordinating the materials of related sciences. One effect of the advance in scientific and medical knowledge has been the blurring of the research boundaries between premedical disciplines, with the result that often the same material is included as pertin-

ent in the course more than one department, each unaware of its appearance in the other. Teaching in the basic sciences will be coordinated for a more orderly presentation of subject matter, decreased compartmentalization, and reduction in undesirable overlap. The traditional system for assignment of time to each department will give way to interdigititation of teaching periods as blocks which fit into the over-all development of subject matter.

One of the major changes will be the introduction of a combined laboratory to replace the usual laboratory associated with preclinical courses. The object of this laboratory will be to expand experience in medical and scientific procedures. During the first part of the course emphasis will be placed on the techniques used in biological sciences and the scientific method. A laboratory project carried on under the supervision of one of the members of the faculty will occupy the remainder of the time assigned. There has been a great deal of discussion regarding the "laboratory instruction." Traditionally, it has been related to lecture material with the implications that the experiments reinforced the student's understanding of the didactic presentation. However, with increasing complexity of meaningful experiments and technical limitations in the laboratory, it is becoming more difficult to adequately relate laboratory and lecture. It is felt that by putting all of the time in one laboratory, one can reach in a more efficient way goals which the individual departments have difficulty in achieving. Specially designed unit laboratories are envisioned to permit students to work individually in small groups on more advanced types of laboratory work. It is recognized that in some courses such as gross anatomy and pathological anatomy the laboratory is more directly related to the subject matter in

the discipline, and these may not lend themselves to integration in combined laboratory exercises. Here, however, serious thought must be given to the development of new teaching methods. Among the concepts we have considered is bringing together normal and abnormal anatomy in a single course.

The past 2 years are essentially unchanged from our present program, except for the seminars in the humanities already referred to. Didactic material has been almost eliminated and has been replaced by clerkships, seminars, and conferences. Six months of elective time is provided which may be taken in 3-month blocks or as a single period. During part or all of this time most students devote themselves to research, either in the basic sciences or in one of the clinical departments at Northwestern or elsewhere. Students also use the elective periods for additional experience as clerks in one of the major clinical departments or a subspecialty area. More than 50 per cent of the students are, even at present, engaged in at least one quarter of research at some time during the 4-year program in medicine. The opportunity is taken by many to work for a combined program leading to a M.S. and the M.D. degree. This can be done without lengthening the medical school program through double registration in the Medical and Graduate Schools. The summer and elective periods, together with free time available during the academic year, usually allow the student to take enough additional course work and carry out enough investigational work for the thesis to qualify for the M.S. degree.

At present, a pilot comprehensive care program gives students an opportunity to consider in greater detail individual patients. This program will be expanded to continue through a 2-year program, permitting the students to follow a patient over a longer period of time.

The Committee at Northwestern early decided that any plan of integration which it ultimately agreed upon should not in any way compromise students from a wide variety of colleges following the usual course of preparation from gaining admission to the program in medicine. The first 2 years of the new program can be regarded as an alternative plan to permit outstanding students who have had the advantage of very good high school training and the requisite motivation to prepare themselves for the regular program after 2 years rather than after 3 or 4 years of college study. Although the two phases of the new program will compensate for the advantages of the more closely integrated course of study, the two groups should be able to fit together in the same curriculum. The medical faculty has not desired to have a special pilot program continued into medical school. They expressed the opinion that if the medical program was good for the limited number it was good for all students, and they have insisted that any changes occurring in the curriculum of the medical school be applied to all students, those twenty to 25 coming into the program after 2 years of special preparation and the 100 students accepted after the traditional 3 or 4 years of preparation.

The Committee was also convinced that the program should not be so rigid as to operate as a handicap to the student who had perhaps made too early a choice of profession. The plan offers considerable flexibility to the student and does not unalterably commit him to medicine. The courses in science could serve as an excellent foundation for students whose ultimate fields of concentration might be physics, chemistry, or biology. At the end of 2 years the student may continue in the College for a degree in these fields. After 4 years he can enter graduate school and work for an advanced degree.

in one of the basic sciences. None of these deviations will compromise the student's place in the program; he may reenter it and continue for his M.D. degree if he so chooses. Many in the group will probably choose to work for a combined Ph.D.-M.D. degree which can be completed in 9 years after graduation from high school—1 year more than the usual length of the traditional premedical and medical programs leading to the M.D. degree. It is hoped that this will attract more students into an academic career in medicine for teaching and research, an area which faces increasing shortages as research expands and new medical schools are developed.

These courses would furnish a more "liberal" education in the sciences than some of current highly professionalized curricula offer and would provide basic concepts and an understanding of a wide spectrum of the sciences upon which they could build with advanced courses, knowledge in depth in one of the fields.

For the students who enter upon this program and continue on to the M.D. degree, the program offers the advantage in the saving of at least 1 year, and possibly 2. The encouragement which the provision may offer to such students is of considerable importance in a special way to the profession of medicine. Medicine is finding increased competition for the pool of top-ranking students, because it no longer occupies the unique position as a profession which it held in the past and shared largely only with law and the ministry. The professional opportunities open to the college graduate are now much broader and provide the prestige, intellectual satisfactions, and financial rewards comparable to those offered by medicine. As the scientific and technological bases of our existence further broaden, we can anticipate only increased competition by engineering schools and graduate programs outside of medicine

for the relatively ever less adequate pool of good students.

Another development gives added import to reappraisal of the program of medical education: the declining quality and quantity of applicants to medical school during the past 4 years. The reason can be explained, at least in part, by the length and cost of the educational program for medicine. The prospect of a long period of student status during the years when contemporaries in other fields are becoming financially independent and starting families doesn't add to the attraction of the profession. The cost of the total educational program measured not only in the monetary outlay but also in the years of income which are denied is certainly having its influence on career choices. Medicine does not have funds to subsidize students which compare with the scholarships and fellowships available for graduate students in the physical, biological, and behavioral sciences. There is scarcely a graduate student in these fields who does not obtain support which provides for tuition and a stipend large enough to defray at least his basic living expenses. This is to be contrasted with the good proportion of students who leave medical school with a sizable debt incurred for their education. They are then faced with additional years of semi-indentured service as an intern and residents, followed by 2 years of military service. These handicaps, considered along with the broader professional opportunities available to the physical and biological scientists which match in prestige, intellectual satisfaction, and financial rewards those offered by medicine, leave little room for doubt that all well considered approaches to increasing the attractiveness of medicine merit deep consideration. We must ferret out the sacred cows in medical education and send them to slaughter.

MEDICAL EDUCATION FORUM

Editorial

THE PHARMACEUTICAL MANUFACTURERS— BOTH SIDES OF THE COIN

"Never kick a man when he is down," may be the initial reaction to the article in this number which is critical of some of the advertising practices of the pharmaceutical manufacturers. During recent years, industry has been kicked by faculty members, by Journals, by the public, and by Senator Kefauver. The publication of the May article in this issue does not mean that we are kicking the industry, and the industry is *not* down.

Allusions in our editorial pages to the problem of the pharmaceutical industry have not been designed to derogate the industry. Rather, they have represented a recognition of its vital importance, its power, and the historical fact that power can bring problems. The interest of medical education in the programs of the pharmaceutical industry is intense because the strong interdependence of the two groups is so obvious.

The current turbulence should not becloud the notable progress in self-policing which the industry has accomplished. The Pharmaceutical Manufacturers Association was established just a few years ago as an evidence of the desire of the industry to police itself. The code of practices of P.M.A. includes such statements as:

1. Prompt, complete, conservative and accurate information concerning therapeutic agents.
2. Any statement involved in product promotional communications must be supported by adequate and acceptable scientific evidence.
3. Quotations from the medical literature or from the personal communications of clinical investigators in promotional communications must not change or distort the true meaning of the author.
4. The release to the lay public of information on the clinical use of a new drug or to a new use of an established drug prior to adequate acceptance and presentation to the medical profession is not in the best interests of the medical profession or the layman.
5. All medical claims and assertions contained in promotional communications should have medical review prior to their release.

The vast majority of the pharmaceutical manufacturers are obviously eager to maintain the high standards of ethical practice that they have fostered over many years. They are faced with the problems of economic survival in a highly com-

petitive industry, yet they have channeled increasing resources in research and educational programs in our medical schools. Their contributions to the National Fund have risen rapidly. The ultimate role of the industry in medical education is only evolving and should be accelerated and fortified by the liaison established with the A.A.M.C., which we have recently commended.

The P.M.A. is making progress through requiring a rigid compliance with the code of practices in regard to advertising. This will correct a problem which has drawn criticism, and will further strengthen relations between the industry and medical education.

JOHN Z. BOWERS, M.D.

Datagrams*

COMPARISON OF FULL-TIME VERSUS PART-TIME STAFFING PATTERNS IN BASIC SCIENCE AND CLINICAL DEPARTMENTS

The wide disparity which exists between the staffing patterns of Basic Science and Clinical Departments affects the relationship between the full-time and part-time components as computed for total medical school faculties. The Datagram, Vol. 2, No. 6 for December, 1960, reported that almost one-third of the total faculty responding to the Faculty Registry Questionnaire served on a full-time basis. This over-all total of 32% full-time faculty is largely influenced by the reverse proportions of full-time and part-time faculty members in the Basic Science and Clinical departments respectively (See Figure 1). The ratio in the first instance is 3 to 1; in the second instance, it is 1 to 3.

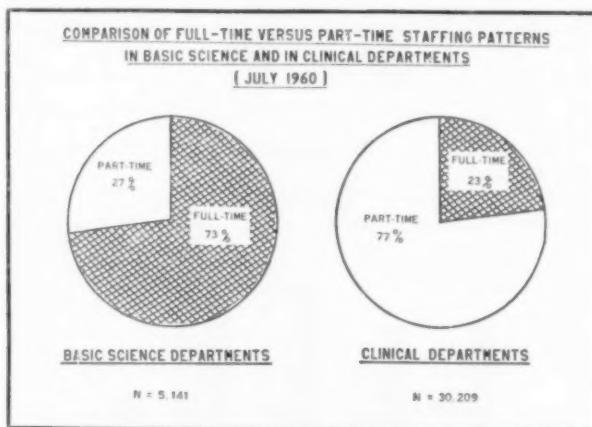


FIG. 1

Note: Respondents to the Faculty Registry Questionnaire were assigned to the Basic Science or Clinical departments on the basis of the departmental affiliation indicated on each return. With respect to most of the questionnaires, no ambiguity existed as to whether the indicated affiliation placed the respondent in the Clinical or Basic Science category. However, in the case of 595 returns, a clear-cut assignment to one or the other category could not be made. These included affiliations in more than one department, affiliation in special research departments common to only a few schools, or a few miscellaneous departmental designations which could not be classified as belonging in either category. These 595 returns were excluded from the tabulation. A description of the sample and a discussion of some of the limitations of the data obtained from the Faculty Registry Questionnaire appeared previously in the December Datagrams, Vol. 2, No. 6 referred to in paragraph 1.

* Submitted by the Division of Operational Studies of the AAMC, Evanston, Illinois.

Considerable similarity exists between the Basic Sciences and Clinical Departments with reference to the percentage distribution of faculties by rank (See Figures 2 and 3).

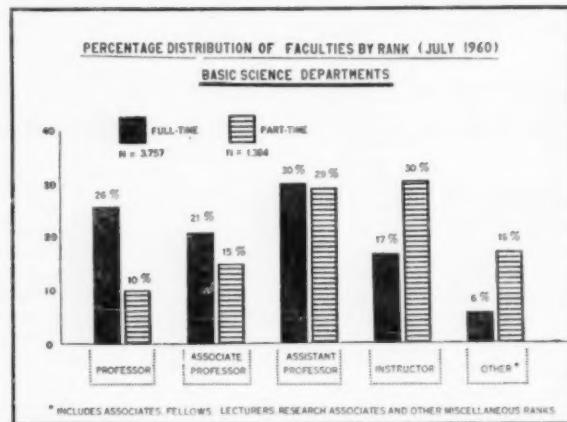


FIG. 2

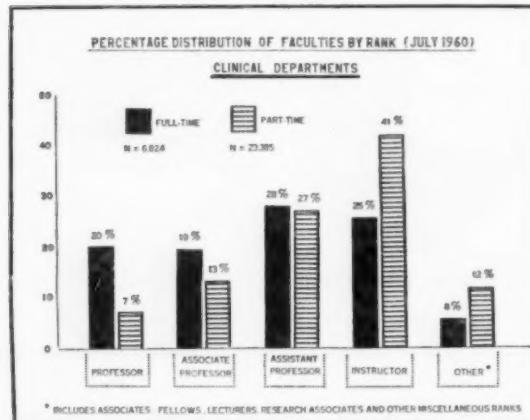


FIG. 3

The greatest difference in the distribution by rank occurs at the Instructor level. Here the Clinical departments employ a considerably larger proportion of part-time personnel than do the Basic Science departments (41% versus 30%). In absolute numbers these percentages (based on widely disparate N's) amount to 9701 Instructors in the Clinical departments compared to 410 Instructors in the Basic Science departments.

The proportion of full-time faculty having attained the rank of professor in both categories is noteworthy. More than one-fourth of the full-time faculty in Basic Science departments have achieved this rank; one-fifth of the Clinical faculty have attained professorial rank. It should be pointed out, however, that the distribution under the rank of professor includes both departmental chairmen and professors who are not heads of departments.

**AMERICAN MEDICAL STUDENTS AND ARTS
AND SCIENCE GRADUATE STUDENTS:**

Their Educational Expenses and Primary Sources of Financial Support

A comparative analysis of the results of recent independent studies of medical students' financial status¹ and arts and science graduate students' financial status² reveals striking differences in both the costs to the students and the primary resources the students draw upon in financing a medical education as contrasted with arts and science graduate education.

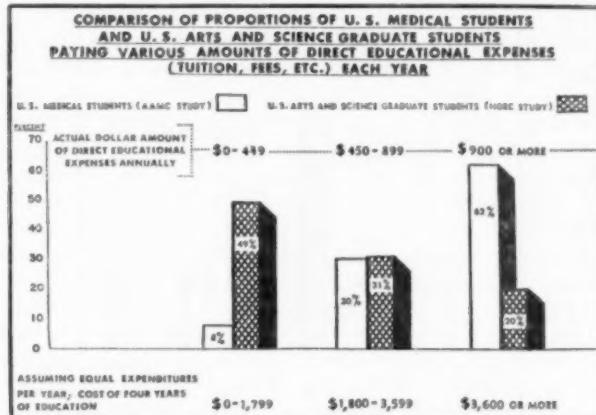


FIG. 1

The average direct educational cost (living costs excluded) to the medical student is about \$1,000 a year, or \$4,000 for four years of medical education. In contrast, the average graduate student pays about \$450 a year in direct educational costs, or \$1,800 for four years of graduate education. Thus, the average medical student has to pay more than twice as much as the average graduate student for his education.

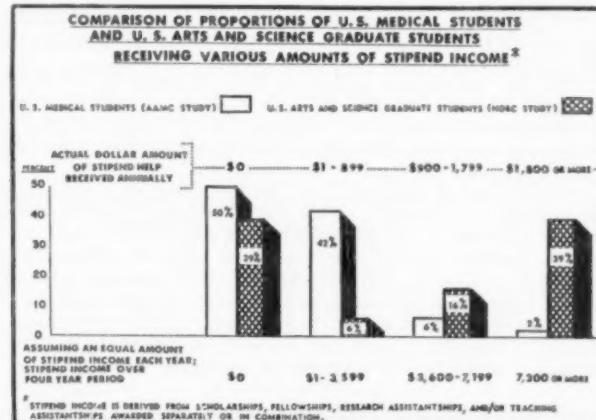


FIG. 2

Submitted by the Division of Operational Studies of the AAMC, Evanston, Illinois. Source of information will be furnished on request.

The medical student who receives stipend income from any source or combination of sources receives an average of about \$500 per year, or \$2,000 during his four years of medical education. The arts and science graduate student who receives stipend income is provided with an average of \$2,000 per year, or approximately \$8,000 over a four-year period of Ph.D. training. Thus, if one combines the fact that the medical student, as contrasted with the graduate student, has to pay twice as much for his education at the same time that he receives one-fourth as much stipend income, (if he receives such income) it becomes clear that there is an 8:1 fiscal ratio of income and expense working to persuade the college senior to enter graduate school rather than medical school.

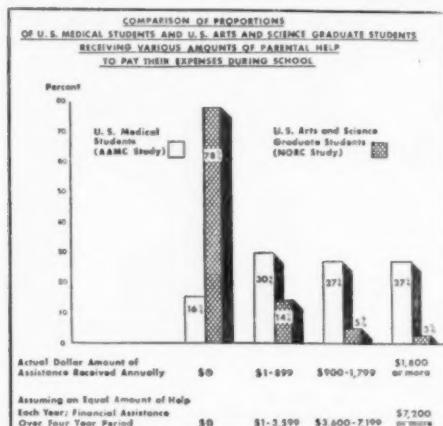


FIG. 8

The medical students use FAMILY HELP as their primary source of income to finance their education while the graduate students use STIPEND INCOME—particularly that derived from research and teaching assistantships. Is the reason for this difference the differing socio-economic status of the families of the two groups of students? While the AAMC study and the NORC study used somewhat different indices of socio-economic level, it is clear that a majority of each group of parents come from the upper-middle or high income groups in our society. Thus, parental economic capability does not appear to be the decisive factor.

The reason for the difference in family help appears to be supplied by the graduate students' answer to the question: "Will you receive any financial support from your parents this year?" Three out of five of the students who did not receive such help, and 44% OF ALL THE GRADUATE STUDENTS IN THE SAMPLE replied, "I don't need any support from them."

The AAMC's continuing analysis of medical students' financial affairs is beginning to suggest two broad conclusions regarding medical students' costs of education and sources of help available to pay these costs as they relate to the decline in medical school applicants in 1957-58, 1958-59, and 1959-60. First, it would appear that in 1957-58 the students' cost of medical education began to outrun the financial resources of even those families in the U.S. who are in a fairly comfortable economic position. At the same time, in 1957-58 international events brought about increases in stipends to graduate students in the natural and social sciences with which medicine was and is in no position to compete.

¹"The American Medical Student: His Financial Status and Problems" (Unpublished study conducted by AAMC)

²"The Financial Situation of the American Arts and Science Graduate Student" (Unpublished mimeographed report by National Opinion Research Center (NORC), University of Chicago, Report No. 74, April 1960, James A. Davis, Ph.D., Study Director.)

Letter to the Editor

I have just returned early this morning on the Frontier Mail after a three-day stay in Delhi attending a Conference of the Deans of Medical Colleges convened by Dr. Srinivasan, Director General of Health Services. As you are aware, the great majority of the Medical Colleges in this country are government-controlled, and hence such a convention by the Director General is accepted as a logical procedure. Dr. Srinivasan in his scope of responsibilities might be compared to the Surgeon General of our Public Health system in America.

The attendance of Deans was almost 100 per cent, some 50 in number, and the three-day session, Chairmaned by the Director General, moved forward at a steady and consistent pace. Besides formally opening the conference, Mr. Karmarkar, the Health Minister, was present at many of the plenary sessions. The *modus operandi* was a discussion of the Agenda, item by item, in a preliminary plenary session followed by multiple Committee meetings for the study of recommendations, which were submitted to a plenary convention for approval on the final day of meeting.

The first item on the Agenda was the high cost of medical education, possible methods of economy, and the financing of Medical Colleges. With the rapid growth of medical institutions in this country and the large amounts of money, state and federal, which are being poured into both old and new colleges, the Government of India is somewhat disturbed by the growing costs of medical education. A previous committee report submitted to the Government two years ago had estimated that a new medical college admitting 100 students to a class would cost approximately eight million rupees. This included the college buildings, furniture, equipment for both teaching and research, library, dormitories for students, and quarters for staff. The Committee this week under the pressures of these rising costs attempted to economize on this amount and submitted a report reducing the above eight million rupees by some 15 per cent. I hardly need state that this issue was debated quite hotly both from the floor and in Committee. In the face of the recent rising cost of construction which has been estimated conservatively as some 25 per cent over the past two years, this economy is actually more drastic than might seem on superficial examination.

The second item on the Agenda related to the problem of increasing the number of teachers for existing and future Medical Colleges. The real bottle-neck in the rapid expansion of medical colleges in India relates to the availability of competent faculty.

This problem was debated by a majority of the Deans present, some of whom very firmly emphasized the dangers of too rapid an expansion of medical colleges. The Committee which considered this item made several recommendations as partial solution to the problem. One recommendation, which I urged in plenary session and was supported by the Committee, related to the utilization of the basic scientist (Ph.D.) in the medical educational effort. The Indian Medical Council does not permit this at the present time. In other words, all medical teachers according to current stipulations must have a medical degree. Another

recommendation submitted by the Committee related to the retirement age and urged that this be raised from 55 to 60 years with opportunity for continued service extending to a maximum of 65 years. This matter has come up repeatedly in past deliberations.

The third item on the Agenda pertained to curricular problems. The usual discussions on departmental priority were carried out with a fair degree of unanimity of opinion. I shall not go into further detail, for this is a matter quite familiar to American medical educators.

Item No. 4 was a discussion on the failure rate in medical colleges. I had been asked by the office of the Director General to submit a paper on this subject, and enclosed you will find my presentation entitled "The Effects of 'Examinations in Crises' on the Study Motivations of Medical Students."* It was a pleasant surprise to me to find that my paper was reproduced in full and incorporated in the Agenda for circulation to the Deans before the Conference. I shall not discuss this matter, for it is explored very frankly in my article. The Committee discussing the failure rate concentrated almost its entire time on the examination system as a major contributory factor. The Committee was unanimous in their recommendations, and these were accepted without change at the final plenary session. The basic content of the Committee action might be epitomized in their concluding statement that the day-to-day assessment of the student's progress should be a determining influence in the ultimate evaluation of his success or failure in Medical College.

Item No. 5 was the integration of premedical courses in the Medical Colleges. There is a growing feeling on the part of certain educators, medical and otherwise, that the premedical year of University education should be incorporated into the Medical College curriculum. Actually in several of the southern states this has already been accomplished. In other words, the medical student is now selected a year earlier than has been the case heretofore. This means that the young men or women will select medicine as a career at the tender age of seventeen. I need not state that I am strongly opposed to such a measure and feel that it is a retrograde step in medical education. I am not alone in this feeling, for many of the Deans opposed this action very strongly. Besides the purely academic aspects there also is the matter of the increased cost of medical education with the need for greater laboratory space and other accommodations, not to mention a larger faculty. This step in the face of a growing concern over the cost of medical education is difficult to understand. Fortunately, the matter was more or less tabled, and no definite decision for or against integration was made. These are the more important and controversial items and those which took the greater portion of our time in plenary session.

It was heartening indeed to note the concern and interest of both the Health Minister and the Director General of Health Services in the problems of medical education. Mr. Karmarker spent the greater portion of the three days of conference either attending our formal sessions or meeting in informal discussions with the Deans.

In my estimation one of the most important things to arise out of this Conference was an initial step taken to create an Indian Association for the Advancement

* Published in this issue, p. 58

of Medical Education. Informally at the close of the session the Deans met and elected a Committee of fourteen members with fairly representative geographical distribution who are to draw up the Constitution and By-laws of this new Association. The members were nominated from the floor, and the entire procedure was very democratic. The fourteen of us will meet in Delhi on the 6th of November to work on the above-mentioned document. This is the first time that the Deans of Medical Colleges here in India have organized in this fashion.

I have been somewhat lengthy in reporting this Conference but I felt that it was rather historic in certain ways and would be of interest.

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Director & Principal
Christian Medical College,
Ludhiana, Panjab, India.

ABSTRACTS FROM THE WORLD OF MEDICAL EDUCATION

ANGELA SANCHEZ-BARBUDO, PH.D.
Abstracts Editor

Aufruf zur Gründung einer Weltvereinigung von akademischen Lehrern der medizinischen Radiologie (An appeal to establish a World Federation of University Teachers of Medical Radiology). HANS R. SCHINZ. Deutsche Medizinische Wochenschrift, Vol. 85, No. 27, pp. 1177-1178 (July 1), 1960.

The author, a professor at the Röntgendiagnostische Zentralinstitut, Zürich (Switzerland) launches this appeal contending that medical radiology today does not occupy, in many instances, the position which corresponds to its importance in the medical sciences. In some schools the chair of radiology is only a part of diagnostic and radiotherapy departments; at others, the whole field is divided into parts separately taught, or even, sometimes, is not taught at all. The aim of a World Federation such as the author has in mind (a similar organization has already been in existence once, from 1924 until World War II) is to provide an opportunity to discuss and clarify questions and problems common to all radiology instructors on the university level, through the means of *circulars*. Any radiology instructor who has a problem may address himself to the organization for advice or support. Eligible for membership would be all *university* instructors in radiology, whether they are physicians or not (medical doctors would be A-members; physicists, engineers or biologists, B-members), while researchers or instructors outside

the academic institutions would be excluded. It is further pointed out that the planned Federation shall by no means enter into competition with any existing national or international Congress of Radiology nor with the International Society of Radiology. The Appeal is accompanied by a list of names of university radiologists all over the world who approve of the project and are willing to apply for membership.

Department Head Training by Proxy.
Hospitals, pp. 70-72, (Sept. 16), 1960.

The *Hospital del Seguro Social*, Panama City, Panama, will be a 260-bed general hospital. When it opens, its department heads will have been trained at the North Carolina Memorial Hospital (University of North Carolina, Chapel Hill). This report tells the story of this unusual hospital staff training program. The *Caja de Seguro Social* in Panama is a government agency which provides pension, disability, and medical benefits to all persons employed in the Republic. Since the new hospital is likely to become the keystone of the agency's entire health program, Mr. Alejandro de la Guardia, Director del *Seguro Social* believed it beneficial to send its prospective staff, though already well trained and competent, for an additional period of special training to some qualified institution in the U.S.A. At the 1958 Annual Meeting of the American Hospital Association in Chicago it was suggested to him by

American hospital authorities that, instead of sending individual department heads to separate hospitals, it might be more advantageous to have them all concentrated for training at one and the same single institution. The North Carolina Memorial Hospital was selected for this program because it offered many unique advantages. Of special importance, among other considerations, was the fact that the North Carolina and the Panama City Hospitals are approximately the same size; both are university-oriented; North Carolina is primarily a rural state, like Panama, and the patients also come from local and distant communities on a referral basis. Chapel Hill, furthermore, is the seat of an Institute of Latin American Studies which is widely known and respected south of the border and will offer the trainees special and cultural advantages. After several months of careful preliminary planning and negotiations, Dr. Robert Cadmus, Director of the North Carolina Memorial Hospital, visited Panama to meet with the Panamanian officials in charge of the project. The training of the hospital department heads will include administration, dietary, food service supervision, medical records, nursing, pharmacy, social service, physical therapy, etc. Near the end of the training period a series of problem clinics will be instituted in which the group will be quizzed on a number of specific questions likely to arise. Although the Panamanian trainees may audit certain courses at the University of North Carolina, this program is primarily an on-the-job training project designed to permit the individual to carry, under supervision, the same duties for which he will be responsible in his country. A research component for this program (which uses the *cadre* system for the first time in the establishment of a civilian hospital) is anticipated to study its development and to evaluate

objectively its advantages and drawbacks for the establishment of new hospitals not only abroad but also in the U.S.A.

A Cooperative Effort in International Neurology.

CHARLES M. POSER. *World Neurology*, Vol. 1, No. 1, pp. 4-5 (July), 1960.

This editorial, launching the first issue of *World Neurology*, emphasizes the international and multilingual nature of the new publication as well as the variety of neurological aspects which it hopes to cover. The practice of clinical neurology and the direction of investigation in the neurological sciences, it is pointed out, vary widely in different countries; geographic factors, language barriers, and even differences in the political viewpoint, may all contribute to produce scientific isolation and lead to scientific chauvinism—a situation often evident in the bibliographies of scientific papers. *World Neurology* hopes to remedy these evils by requesting review papers on current concepts and recent progress in their fields from the authorities in clinical and basic neurology and allied disciplines throughout the world. The papers will then be translated into English, French, German, or Spanish—in each case a language different from the one most often used by the author—and will be followed by comprehensive abstracts in the other three. The editorial board (whose members and consulting editors represent not only many different countries and languages but also a variety of interests within the neurologic sciences) express the hope that the new publication, official organ of the World Federation of Neurology, will reflect the needs and desires of readers all over the world and thus become a main source of general neurologic information as well as an agenda for specific professional and universal activities and a means of exchange of documents useful for prac-

tice, research, and teaching in this field of endeavor.

El Ministerio de Sanidad y Asistencia Social y la Educación Médica en Venezuela. DR. A. ARREAZA GUZMÁN. *Acta Médica Venezolana*, Vol. 7, No. 4, pp. 131-135 (Oct.-Nov.-Dec.), 1959.

The development of the Department of Health and Welfare in the Venezuelan Republic is closely associated with the teaching and research activities in the field of public health and preventive medicine. The greatest difficulty in first establishing this Secretary in 1936 was the then prevailing, almost total, lack of trained personnel. Through recommendations of the Rockefeller Foundation a group of Venezuelan physicians was then sent for a 6-month period of intensified special training to North American schools, while courses for other health staff (nurses, hygienists, inspectors, etc.) were simultaneously carried on within the Republic. Although the situation had improved greatly by 1940, the need for a steady supply of doctors and personnel, specialized in the field of public health and social medicine, continued. A special year course for *Médicos Higienistas* created in 1942 had to be discontinued in 1945. Thereafter, fellowships for study in the U.S. were re-established; but this system did not work out well, since altered post-war conditions had brought about a radical revision of the public health programs at American schools, which did not meet anymore the specific Venezuelan needs. In 1948, therefore, the *Sección de Preparación de Personal* was created within Venezuela's own Department, and this led to the establishment of a new series of courses for *Médicos Higienistas*. Reorganized and directed, since then, by the *Sección de Preparación*, these courses have given excellent results and are still developing and expanding today. Among other special

courses in the field of health discussed in detail in this report is the *Curso de Malariología* which was established in 1944 (modeled after a course carried on in Rome until 1940 under the sponsorship of the League of Nations) and designed to help activate the Government's fight against malaria. In the same way, the battle against tuberculosis and the intensified activities in pediatrics and mental health brought about the systematic organization of continuous training courses for postgraduates specializing in those fields of endeavor. Furthermore, after the 1945 revolution had put into evidence the extreme state of poverty and sanitary neglect of Venezuela's rural areas, the entire class of medical graduates of that year, the so-called "Promoción Vargas," after attending one special intensified course in rural health and hygiene, were sent out to work in the country. This experiment, although much criticized at first, did produce, according to the author, very good results. Since it has never been repeated since, however, the lack of specially trained doctors and auxiliary health personnel again became acute, until the establishment of the *Cursos de Orientación* (for medical graduates destined to work in Venezuela's rural areas) and the *Cursos Básicos de Sanidad* (aimed mainly at the extension of anti-tuberculosis measures to rural zones). Until about a decade ago, the Venezuelan Department of Health and Welfare had been orienting its teaching functions almost exclusively toward *preventive medicine*. With the 50's, however, another dimension was added when it adopted as a "doctrine for action" the concepts of *integral health* and *comprehensive medicine*. Its courses and activities in this realm, described in detail in the present report, have been emphasizing the essential function of the national universities in the field of public health

and social medicine, especially after the recent fall of Venezuela's dictatorship.

History and Development of Teaching Hospitals in England. SIR ARTHUR THOMPSON, M.D. British Medical Journal, pp. 749-751 (Sept. 10), 1960.

Since teaching hospitals in England are at present traversing a critical stage of development, the author feels that a deeper insight into the course of their historical evolution might be of help to administrators approaching the actual urgent problems. For 200 years after the Reformation, England was virtually without hospitals: in a rural and semi-feudal society the needy sick were scattered in the villages, and it was not until toward the 18th century that this pattern was rapidly and radically changed by the industrial revolution. It was, above all, the constant threat of epidemic disease among the large numbers of industrial workers concentrated in the principal urban centers which became the compelling force in drawing attention to the public health conditions. Another factor in hospital development is seen in the change undergone by the English religious concepts in the 18th century: until then, they had been under the influence of Calvin's belief that salvation must come through divine grace, not through good works, whereas after the Wesleys Puritan charity became an obligation. As a result, a large number of charitable institutions in the shape of *voluntary* hospitals were founded in the 18th century. The manner in which some of them became teaching hospitals, thus greatly influencing the progress of medicine in England, is examined by the author. A very important factor in this development is seen in the establishment of medical schools within the precincts of the hospitals, or closely associated with them, which leads Sir Arthur to

trace a brief outline of medical education in England. He also points out that a dispassionate survey of the history of medicine in the 19th and early part of the 20th century leaves no doubt that England compared badly with other countries—especially with Germany. The latter's leadership in medical progress at that time is seen in the fact that German medical education had not been divorced from the influence of the universities throughout the 19th century as had been the case in England, where the emphasis then had been on vocational training, with the aim to produce the competent practitioner, thus neglecting the cultivation of scientific methods and critical thinking. As to today's crisis, the immediate problem before the boards of governors is, according to the author, to what extent they should encourage in their hospitals further expansion of the university influence which has already proved its value. There is, he says, no simple solution, a great deal depending on the caliber and personality of the men composing the "academic units" in the hospitals. On the other hand, he sees a real danger in conveying too much "absolute professorial power" in the hospitals. It is pointed out, furthermore, that part-time clinical staffs of teaching hospitals are as essential to the development of academic units, as are progressive schools of applied technology to pure science. If a teaching hospital is not to become a "university department of human biology," any advance in knowledge should be critically examined by those who later may assume responsibility for its application. Hospitals and schools could not, the author believes, find a better way to repay their heavy indebtedness to the universities, than by constantly striving to reconcile in their wards and laboratories the claims of exact science with those of humane practice.

Impressions of a Medical Tour of the Eastern and Western Regions of Nigeria. G. M. BULL, M.D. The West African Medical Journal, Vol. IX, No. 4, pp. 139-144 (August), 1960.

The author, a member of the Department of Medicine, Queen's University of Belfast, has been touring Nigeria for 3 months (1958/59) at the invitation of its regional governments, visiting government hospitals, health and maternity centers, dispensaries, as well as mission hospitals and other privately run institutions. By helping with out-patient work and the like, Dr. Bull was able, he believes, to obtain a fairly clear picture of the principal health problems of that region, which are discussed in this medical travelogue. Apart from the highly interesting clinical experience gained by the visitor through a study of certain diseases never met before or of others, common in the West, which show very different aspects in Africa (heart disease, for instance), what most impressed him was the way Nigeria has tackled some aspects of their principal and most urgent problem: to provide medical care for a large population on what, by Western standards, is a pitifully inadequate budget. Although Dr. Bull thinks that Great Britain and other Western countries may learn a lot from Nigeria's health administration (an experiment, by a native doctor, in the village treatment of mentally disturbed patients is cited as an example), in this report he does not dwell so much on the often astonishing successes but rather considers a series of urgent problems for which help is needed and improvement is possible. From its present policies it would appear that Nigeria plans to build a health service on the British pattern of hospital services rather than after the U.S. model of private insurance schemes. Although this should be the goal in the long run, an approximate assessment of

the costs the British plan would mean for Nigeria indicates that the financial resources of that country are not adequate to develop health services along present lines in Britain. It is suggested, however, that Nigeria follow the same general line of development as the United Kingdom, that is, public health first and national service later. There are a number of measures in preventive medicine which do achieve a very substantial improvement in community health at very low cost and which could be applied without delay in Nigeria (quoted is an example of such measures which have proved efficient in bringing about a substantial fall in child mortality rates). Other public health measures, such as the provision of clean water supply and sewage disposal in towns, although they do require considerable initial expenditures, should still have priority over hospital building expenses of the same magnitude for reasons Dr. Bull explains in detail. He also discusses what he believes to be the principal causes for Nigeria's present neglect of public health in favor of the building up of hospital services, and he gives some advice on how to modify the prevailing systems. In the field of curative medicine, on the other hand, urgent consideration should be given to methods which would improve the standard of out-patient practice (of fairly recent development as far as the provision of treatment for the general population is concerned). Some possible partial solutions are suggested.

Le Péril Tuberculeux dans la Province de Québec (The Danger of Tuberculosis in the Quebec Province). J. A. VIDAL. *L'Union Médicale du Canada*, T. 89, No. 9, pp. 1105-1108.

After having been active for half a century in the fight against tuberculosis, the author is opposed to the idea now

prevailing, especially among the younger generation, that the problem of tuberculosis is practically solved. Although mortality rates have diminished greatly, the same cannot be said of the *morbidity* rates. It is very possible that the same antibiotics which have prevented a great number of deaths may have increased the number of contagious T.B. patients. Exact morbidity rates being, however, more difficult to establish than mortality rates, more research is needed for their evaluation. If the author raises these questions, it is not to throw fear into the people but to alert public opinion to the dangers of "false security." That tuberculosis must still be considered an endemic disease can be inferred from the statistical figures concerning the Province of Quebec: while the last 50 years the mortality rate has fallen there from 205 per 100,000 to 9.6 (it fell from 48.9 to 9.6 during the last decade), hospitalizations of T.B. patients declined only from 4,788 cases in 1949, to 4,128 in 1958. The author's point of view is

further emphasized by the fact that in 1949 there were 3,705 first admissions for T.B., and in 1958 not less than 2,782. A survey of the etiologic aspects of the disease today indicates that men are more prone to develop tuberculosis than women (this trend appears accentuated considerably in 1958). Mortality is more frequently met among the older age group, that is, between the 40- and 50-year-old. Comparing statistics on tuberculosis in the Province of Ontario with those in Quebec it becomes obvious that, although both areas have about the same industrial and rural population, Quebec is in an inferior position as to the incidence of T.B. (the decline of the mortality rate, furthermore, has considerably slowed down since 1954). All this, the author concludes, does amply justify the continuation of the fight against the disease (especially in certain sectors and areas of the population) through education of the public, better means of prevention and detection, and better control and observation of discharged patients.

NEW BOOKS

KENNETH E. PENROD

Book Review Editor

Abstracts

Cardiac Emergencies and Related Disorders.

Their Mechanisms, Recognition and Management. By HAROLD D. LEVINE. New York: Landsberger Medical Books, Inc., 1960. 361 pp. \$12.00.

This monograph is the outgrowth of a series of seminars presented during the last 15 years to fourth-year students. It represents a synthesis of the "main stream" of medical thinking at the Peter Bent Brigham Hospital, of the author's own experience, and of what reading he has done. An attempt has been made so to formulate the text that it may prove of interest and value to cardiologists, internists, general practitioners, and students. It is intended neither as an introduction to the subject nor as a summary of recent advances in the field. Emphasis has varied. In some portions the author has gone into rather minute detail in procedures; in others, where this has not seemed necessary, he has sketched in a bare outline. An attempt is made not only to outline or detail plans of management, but to explain the mechanisms of the syndromes being considered and the mode of action of therapy. The principal effort has been to provide in a ready reference the necessary information to deal with cardiac emergencies.

Treatment of Cardiovascular Emergencies.

By ALDO A. LUISADA and LESLIE M. ROSA. New York: Blakiston Division, McGraw-Hill Book Co., Inc., 1960. 114 pp.

This small monograph, measuring 4 x 7 inches, is designed to be carried in the physician's bag. It is devoted solely to the therapy of cardiovascular emergencies which would be useful to the practitioner. The book deals basically with therapy; brief diagnostic considerations are presented only as subsidiary help in the understanding of thera-

peutic problems. Each chapter is followed by a brief bibliography. It is limited to a few, usually recent, articles which are quoted in the text.

Essentials of Pharmacology. By FRANCES K. OLDHAM, F. E. KELSEY, and E. M. K. GEILING. 4th ed. Philadelphia: J. B. Lippincott Co., 1960. 396 pp. \$7.75.

This edition is designed, as were the preceding three editions, to give the student a broad and up-to-date survey of pharmacology and to prepare him for the evaluation of future advances in the field. It has been necessary to considerably lengthen the text. The principal new field of psychopharmacology prompted the inclusion of a new chapter entitled "Hallucinogens and Tranquillizers," and the addition of a section on monoamine oxidase inhibitors to the chapter on "Central Nervous System Stimulants." A consideration of the newly introduced hypoglycemic agents follows the discussion of insulin in the endocrine section. Throughout the text special attention has been paid to recent advances in our understanding of the mechanism of action of drugs. Each chapter concludes with a short bibliography and a list of important drugs. Dosages, unless specified, are those of a single adult dose. Official, generic, or chemical names are used wherever possible; proprietary names are indicated by capitalization of the initial letter. In the main this book is intended to serve as an introductory text in pharmacology.

A Textbook of Histology. Functional Significance of Cells and Intercellular Substances. By JOHN C. FINERTY and E. V. COWDRY. 5th ed. Philadelphia: Lea & Febiger, 1960. 528 pp., 502 illustrations. \$11.00.

The primary aims of the present edition are to include the more recent concepts of

cellular structure and function and to make this a textbook which will be of maximum assistance to the beginning student of medicine and the allied professions. This textbook is not intended to be a primary reference, but rather an organized review of cells, intercellular substance, tissues, and organs which will assist with identification as well as with correlation of microscopic structure and function. Even though this edition has been completely revised and rewritten, it is still a direct descendent of Cowdry's *A Textbook of Histology*, and leans heavily on text and illustrations of previous editions. The central theme of the book is still the blood vascular system, the great integrator. All illustrations are of human material unless otherwise noted.

Obstetrics. By J. P. GREENHILL. 12th ed. Philadelphia: W. B. Saunders Co., 1960. 1052 pp., 1219 illustrations. \$17.00.

The textbook is a direct descendent of the original prepared by Dr. Joseph B. De Lee. This edition was prepared with the help of 23 contributors. The new chapters contain important and up-to-the-minute data concerning the physiology and biochemistry of the placenta, nutrition in pregnancy, endocrine changes in normal pregnancy, the mechanism of labor in cephalic presentation, obstetric roentgenology, the psychology of pregnancy, labor and the puerperium, the toxemias of pregnancy, diseases of the heart, circulatory system, blood, digestive tract, kidneys, lungs, eyes, ears, nose, and nervous system, endocrine diseases, fetal erythroblastosis, diseases of the chorion, pathology of the newborn, brain injury and its sequels, and medicomoral problems. Not only have valuable chapters and sections been added, but every page of the text has been rewritten and brought up to date. Many old illustrations have been removed, and 162 new ones have been added.

Medical History-Taking. By IAN STEVENSON. New York: Paul B. Hoeber, Inc., 1960. 266 pp. \$6.50.

This book is based on the conviction held by the author that the young physician can add other skills to this one as he continues his training and experience after gradu-

ation, but if he has not acquired comfort and dexterity in history-taking and interviewing by the time he graduates from medical school, he will practice medicine with incomplete data for which no other skill can compensate him or his patients. There are several excellent textbooks of physical diagnosis, yet these deal only briefly with history-taking and interviewing. For these reasons this book may prove useful to medical students and to practitioners for whom a textbook can enhance the value of personal instruction and practice.

Outline of Pathology. By JOHN H. MANDOLE, JR., and THEODORE E. BOLDEN. Philadelphia: W. B. Saunders Co., 1960. 294 pp. \$4.75.

Stimulation for the preparation of this manuscript has come from discussion with medical and dental students, interns, residents, and general practitioners. This outline is designed to serve the student as a basis for study, and the graduate as an adequate recall instrument. Part I consists of a relatively thorough treatment of the basic pathologic processes. Part II considers only the more specific attributes (and variants) of the basic processes as they apply to the organ systems. There has been no attempt to present any startling new material, and every effort has been made to take the "middle of the road" on controversial issues.

Clinical Applications of Bronchology. By DEZSO KASSAY. New York: Blakiston Division, McGraw-Hill Book Co., Inc., 1960. 213 pp. \$15.00.

Because this book is written for general practitioners and other physicians who are interested in bronchology and who may have occasion to use a bronchoscope in their practice, basic techniques for its use; premedication, and anesthetics; positioning of the patient; and other practical information are described in detail. Of course, not every condition which might indicate bronchoscopic procedures is included in this book. However, those most frequently encountered are discussed in detail, and the general principles are applicable in the investigation and treatment of most conditions. The material presented here will provide an up-to-

date guide for bronchoscopic procedures and will show how the experience and techniques of the bronchologist can be of value in discerning and diagnosing diseases of the lungs.

Meaning and Methods of Diagnosis in Clinical Psychiatry. By THOMAS A. LOFTUS. Philadelphia: Lea & Febiger, 1960. 160 pp. \$5.00.

Recent progress in the study of biochemical and neurophysiological antecedents and correlates of behavior and of the new psychopharmacologic and psychotomimetic agents poses a renewed challenge to psychiatry to define its nosology in terms of universally observable, reproducible concepts. It is in the spirit of meeting this challenge that this volume is written. While a number of texts are available as guides to psychiatric examination and history-taking, the present volume is unique in that the method of examination, history-taking, and diagnosis is combined in a discursive, progressive fashion which highlights the actual exchange of information that occurs between the doctor and his patient, and discusses diagnosis as it proceeds. There is a section on psychiatric consultation which the resident physician and the general practitioner will find especially helpful in hospital and bedside work. It is a succinct statement of the author's experience with both the problems encountered by resident physicians and those encountered by medical students in understanding and treating the patient on the medical and surgical wards of the general hospital. A plan for the manipulation of the doctor-patient relationship is presented. There are exercises in the last chapter which present condensed histories and psychiatric examinations for review. A series of questions is asked at the end of each case history which summarizes the important psychopathology and diagnoses.

Staining Methods—Histologic and Histochemical. By J. F. A. McMANUS and ROBERT W. MOWRY. New York: Paul B. Hoeber, Inc., 1960. 406 pp. \$10.00.

The improvement of histologic techniques and the multiplication of histochemical methods have created the need for a text-

book integrating the newer methods of tissue examination into the standard laboratory procedures. This book was prepared to fill that need. The authors selected from the large array available the single or several methods they considered most valuable for the adequate and efficient staining of histologic preparations. Those presented are regarded as effective, reliable, and easily mastered. They are largely those with which the authors have had a considerable amount of personal experience. In addition to staining methods, the book includes a discussion of the essential processes for preparation of the tissues for staining: fixation, dehydration, embedding, and sectioning. Also included is a special section of recommendations concerning methods especially useful for the study of specific body organs and tissues. The range of procedures and stains covered insures that the book will be useful in routine work and in research by pathologists, histologists, histochemists, cytologists, and their technical associates. It shall prove valuable to anyone who examines human or animal tissue with the microscope.

Controlled Clinical Trials. Papers Delivered at the Conference of the Council for International Organizations of Medical Sciences. Organized under the direction of A. BRADFORD HILL, Chairman of the Conference. Springfield, Illinois: Charles C Thomas, 1960. 177 pp. \$5.00.

This conference was held in Vienna, March 23-27, 1959, under the chairmanship of Professor A. Bradford Hill and under the joint auspices of UNESCO and WHO. The purpose of the meeting was to discuss the principles, organization, and scope of those trials which must be carried out if new methods or preparation used for the treatment of disease are to be accurately assessed clinically. The meeting was a closed one, and only 100 participants were invited. One national group, the British, was charged with the task of presenting each topic to be studied. In this way, all papers were coordinated in London by Professor Hill so that overlap was avoided and ample time allowed for discussion. Originally it was not intended to publish the proceedings in English, since the literature on this subject

is already extensive. But, reacting to demand, the introductory papers were published in full in mimeographed form. These were soon exhausted, and the decision was made to bring out a printed version. The initial papers of seventeen contributors are contained herein.

Cellular Aspects of Immunity. Ciba Foundation Symposium. Edited by G. E. W. WOLSTENHOLME and CECELIA M. O'CONNOR. Boston: Little, Brown & Co., 1960. 477 pp. \$10.50.

This conference, attended by 34 participants, was held June 3-5, 1959. This symposium shows that the immunologically competent cell, rather than the antibody, has become the central theme of immunology. The international group of participants in this symposium presented material on the population dynamics of mesenchymal cells as they are modified and influenced by immunological processes, and considered the question of how the immunological information that is lodged in an immunologically competent cell is conveyed to it. They discussed, too, how that information can be transmitted, over long periods of time, presumably by a process of cellular descent, to account for the characters of immunological memory.

Human Ecology and Health. An Introduction for Administrators. By EDWARD S. ROGERS. New York: The Macmillan Co., 1960. 321 pp. \$7.75.

This text evolved as the product of many years of teaching graduate students in public health and discovering with them some of the significant pieces of knowledge that lie behind an understanding of the responsibilities and widening horizons of public health and its related fields of community service. Ecology is the study of the relations between organisms and their environment. Human ecology, then, is the study of the relations between man and his environment, both as it affects him and as he affects it. As a science, ecology appears to have been most highly developed by the zoologists and biologists. But human ecology has been of considerable interest to geographers and social anthro-

pologists, and somewhat more recently to sociologists, especially in terms of urbanization and so-called areal patterns. No one should be more alert to the significant trends of the times than the administrator. His decisions may greatly influence both the opportunities for productive research on the part of those associated with him, and the realism with which long-range planning takes place in his field. It has been with this conviction in mind that the materials in this text have been assembled and focused upon an essentially ecological approach to the understanding of the trends and patterns of health needs and health services responsive to them. Although the first three sections presented in this volume are self-contained and reasonably complete, they have been prepared with the intention that they be supplemented by lectures and discussions which will give current and specific focus to what otherwise might constitute a very general treatment of important subject matter. These three parts are entitled: "Demographic Background," "The Health Status of the Population of the United States," and "An Ecologic Approach to the Concept of Health and Illness." Part IV, "Readings and Related Tables" presents tabular data of importance but which are too lengthy or too detailed to be included in the main text without loss of continuity of the materials being presented. Also, Part IV contains several sections devoted to methodological discussions and explanatory notes.

Graduate Education in the United States. By BERNARD BERELSON. New York: McGraw-Hill Book Co., 1960. 346 pp. \$6.95.

Here are the facts about the present state of graduate study in the United States, bringing together the largest and most important body of data on graduate education now available. In working up this study, the author reviewed the available literature and talked with graduate deans, presidents, deans, departmental chairmen, and faculty members in many colleges and universities. Questionnaires were sent to graduate deans in 92 universities, the graduate faculty in the same universities, a sample of the 1957

recipients of the doctorate, the presidents of all liberal arts and teachers colleges, and all industrial firms employing over 100 professional and technical personnel. The book consists of three sections: The first is a review of the history of graduate education in this country over the past century or so. The second, the main body of the report, is an analysis of the programs and issues current in the system of graduate education, covering the purposes, institutions, students, and programs. The third section includes a summary of conclusions, a commentary on them, and recommendations as to what should be done.

American Pharmacy. Textbook of Pharmaceutical Principles, Processes and Preparations. Edited by JOSEPH B. SPROWLS, JR., with 20 contributors. 5th ed. Philadelphia: J. B. Lippincott Co., 1960. 472 pp. \$10.75.

This edition has been completely reset to agree with the Sixteenth Revision of the "United States Pharmacopoeia," the Eleventh Edition of the "National Formulary," and the latest edition of "New and Non-official Drugs." The extensive material dealing with the preparation of parenteral products has been covered in a separate chapter with the addition of a new author to cover the material on solutions. Numerous illustrations have been added or replaced in order that the student may become familiar with machinery and apparatus which are in current use.

Sea Within. The Story of Our Body Fluid. By WILLIAM D. SNIVELY, JR. Philadelphia: J. B. Lippincott Co., 1960. 143 pp. \$3.95.

One cannot fathom the physical nature of man until he knows something of the body fluid, man's heritage from the great ocean. Only within the past two decades has medical science accumulated sufficient facts to make possible effective management of the myriad diseases which involve our vital liquid. This book is intended primarily for the great number of laymen who are intrigued by the scientific aspects of human life. It may also be of interest to physicians, nurses, technicians, dietitians,

and students as background reading for technical treatises on body fluids. It is hoped this book will give the reader an enjoyable and stimulating excursion into a real-life Wonderland, as it describes the crucial role in which the body fluids, our sea within, plays in the physiologic drama of our daily lives.

Medical and Biological Research in Israel. Edited by MOSHE PRYWES. Obtainable through Grune and Stratton, Inc., New York. 551 pp. \$8.00.

This book, unique in its nature, is designed to serve as a guide not only to what has been accomplished, but also, and in particular, to what yet remains to be done. Viewed in their proper setting, the achievements are in fact more significant than they would at first sight appear to be. They have certainly had marked effects on the health and living standards of Israel. The publications included in this survey cover areas of both fundamental and applied research. The book contains about 2000 references which were selected from among 5000 publications covering the areas of both fundamental and applied research in the fields of medicine, biology, and agriculture.

Chemotherapy in Emotional Disorders. The Psychotherapeutic Use of Somatic Treatments. By FREDERICK F. FLACH and PETER F. REGAN, III. New York: Blakiston Division, McGraw-Hill Book Co., Inc., 1960. 295 pp. \$10.00.

The preparation of this book was stimulated by three questions: How may the physician integrate somatic and psychologic therapeutic approaches in a meaningful way? When confronted with a particular patient, how can he decide whether or not to employ a somatic agent? If he elects to use a somatic agent, which one will he select in order to achieve his desired goal? Although specific information about somatic therapies is provided, the book has been designed primarily to present what appears to be a sound, practical basis for the incorporation of these therapies into psychotherapeutic treatment programs. An attempt has been made to discuss major areas of interest and to present principles which

would be applicable to the clinical use of somatic agents currently available and of the others which will surely be developed in the next few years. No attempt has been made to outline the therapeutic management of every conceivable clinical situation which may arise, since to do so would distract from the primary purpose of this presentation. In the first section of this volume, the principles and techniques involved in the evaluation of patients are discussed. In the second section, the various physical treatments and their spheres of effectiveness are described in detail. In the third section, these considerations are blended to illustrate the manner in which physical treatment can be used to enhance psychotherapeutic treatment. The presentation should be of interest and value to the psychiatrist, the psychoanalyst, the general practitioner, and all physicians, who are confronted with the responsibility of helping the emotionally ill patient.

The Dispensatory of the United States of America—1960 Edition. Volume II. New Drug Developments Volume. By ARTHUR OSOL and ROBERTSON PRATT, with four associates. Philadelphia: J. B. Lippincott Co., 1960. 236 pp. \$9.00.

Since the 25th edition of "The Dispensatory" was published nearly 5 years ago, somewhat more than 200 new drugs have come into use. One purpose of this New Drug Development Volume, which constitutes Volume II of U. S. D. 25, is to provide information about these new therapeutic substances. Another is to give new information about certain drugs already described in the main volume of U. S. D. 25. A third

purpose is to provide general survey articles on certain categories of medicinals—such as Antibiotics, Antibiotics with Antitumor Activity, Hypoglycemic Sulfonylureas and Biguanides, Psychotherapeutic and Psychotomimetic Drugs, and Saluretic Agents. This volume is intended as a companion book to U. S. D. 25 and extends its usefulness over the interim between revisions of "The Dispensatory."

Fundamentals of Chest Roentgenology. By BENJAMIN FELSON. Philadelphia: W. B. Saunders Co., 1960. 269 pp. 450 illustrations. \$10.00.

The approach adopted for this book is based on the old axiom: Know the basic principles and you can solve most of the problems. This book deals primarily with fundamentals and considers specific disease entities only insofar as they illustrate, or are illustrated by, the principles discussed. The book is intended for cover-to-cover reading and, subsequently, as an unobtrusive consultant. It is by no means a complete dissertation on the subject but reflects chiefly the interests and experience of the author. Certain areas have been entirely neglected, partly to conserve time and space, partly through oversight, but mainly from an understandable reluctance of the author to exhibit his own shortcomings.

Books Received

WHY? Divine Healing in Medicine and Theology. By GRAHAM N. W. LESSER. New York: Pageant Press, Inc., 1960. 144 pp. \$2.75.

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1. Stephens, V. C., et al.: J. Am. Pharm. A. (Scient. Ed.), 48:620, 1959.
2. Salitsky, S., et al.: Antibiotics Annual, p. 893, 1959-1960.
3. Reichelderfer, T. E., et al.: Antibiotics Annual, p. 899, 1959-1960.
4. Kuder, H. V.: Clin. Pharmacol. & Therap., in press.

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NEWS FROM THE MEDICAL SCHOOLS

West Virginia Appoints New Dean

DR. CLARK K. SLEETH, a native of Marion County who has come up through the academic ranks at West Virginia University, was appointed Dean of the institution's School of Medicine, January 1.

Dr. Sleeth succeeds Dean E. J. VANLIERE, who reached retirement age last October, but has remained in the position at the President's request.

Dr. Sleeth received his A.B. degree and B.S. in medicine at West Virginia before going to the University of Chicago for his M.D. degree. Following an internship and a residency in medicine at Henry Ford Hospital, Detroit, Mich., he returned to the university in 1941 as an assistant professor of medicine. He has remained at W.V.U. since, except for World War II duty in Europe as a U.S. Army Air Force aviation physiologist. In 1948, he was promoted to associate professor of medicine, and since 1958, also has served as assistant to Dean E. J. VanLiere.

An internist, Dr. Sleeth is the author or co-author of approximately 35 articles which have appeared in professional journals over the past two and a half decades. Most of his research has been in the field of gastrointestinal physiology, especially as it is concerned with the lack of oxygen and the effects of drugs.

In announcing the appointment, President ELVIS J. STAHR JR., said, "Dr. Sleeth is clearly one of the most respected members of the university, as well as the Morgantown community. He also is a recognized leader in the medical profession of the state. My recommendation to the Board of Governors that he be appointed Dean was based not only upon my absolute confidence in his ability and dedication but also upon very strong endorsement by our medical faculty and students, by the West Virginia State Medical Association, and by many individual citizens who know him well."



DR. CLARK K. SLEETH

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**Shands HANDBOOK
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With the rapid aging of our population, orthopaedics is becoming an increasingly important area of knowledge for nearly every physician. The 5th edition of this handbook can give your students an up-to-date presentation of the fundamentals of diagnosis and treatment of orthopaedic cases. It comprehensively discusses injuries, diseases and deformities; it also explains how to improve and preserve the function of the bones and joints and motor apparatus when function is impaired by defects, lesions or diseases. All aspects of orthopaedics are covered—for both child and adult. There are 17 concise discussions of particular orthopaedic problems and four sections on the diagnosis and treatment of neck and shoulder conditions. You'll particularly appreciate how the authors present the chapter on "Congenital Dislocation of the Hip" with up-to-date material and illustrations.

Rusk REHABILITATION MEDICINE

By HOWARD A. RUSK, M.D., Professor and Chairman of the Department of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, New York, N. Y. and 36 collaborators. With the editorial assistance of EUGENE J. TAYLOR, A.M. 1958, 572 pages, 6 $\frac{3}{4}$ " x 9 $\frac{1}{4}$ ", 172 figures. Price, \$12.00.

This forward-looking book is a broad presentation written to show today's and tomorrow's physicians what they should be doing or learning to integrate rehabilitation procedures with the necessary medical or surgical care of the patient. Containing a well balanced blend of basic rehabilitation principles and their clinical application, this book can guide your students to an understanding of their future role in this complex and sometimes difficult phase of medicine. You'll find a wealth of practical information on rehabilitating the patient with such problems as cancer, pulmonary disorders, paraplegia or quadriplegia, metabolic diseases and many other diseases.



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Albany

An undergraduate teaching program in behavioral sciences has been established at the Albany Medical College, according to Dr. HAROLD C. WIGGERS, Dean. To administer the program, a new sub-department of behavioral sciences has been created within the college's department of psychiatry, with Dr. FREDERICK D. McCANDLESS, associate professor of psychiatry and former head of Albany Hospital's psychiatric outpatient clinic, named to head the sub-department.

Presented to students during their first two years of medical training, the program is designed to integrate and expand teaching in such subjects as psychology, sociology and anthropology, especially where they have application to the understanding of health problems. One of the goals of the program, Dr. Wiggers said, will be to encourage future physicians to consider the psychologic and sociologic aspects of their patients' illnesses. The program will go into effect next September.

Dr. JULES S. GOLDEN, former faculty member at the University of Minnesota Medical School, has been named assistant professor of psychiatry. He is successor to Dr. Frederick D. McCandless as head of Albany Hospital's psychiatric outpatient clinic.

Dr. JOHN F. ROACH, professor and chairman of the department of radiology, has been elected a member of the board of trustees of the American Board of Radiology.

Arkansas

Dr. F. DOUGLAS LAWRAZON is leaving his post as Dean of the Medical School to accept a position as executive medical director of Merck & Co., Inc., at West Point, Pa. Dr. Lawrason will be responsible for all the medical activities of

the company including clinical research and clinical evaluation of all drugs developed in Merck's research program.

Since 1955 Dr. Lawrason has served as provost for medical affairs, Dean of the School of Medicine, and professor of medicine at the University of Arkansas Medical Center. From 1953 to 1955 he was assistant professor of medicine and Assistant Dean of the North Carolina School of Medicine. Prior to that he was a professional associate at the National Research Council in Washington, D. C., and an assistant professor at the Yale School of Medicine.

Dr. TOM D. NORMAN, associate professor of pathology at Tulane University and formerly of the Arkansas pathology staff, is to return to the Medical Center as head of the department of pathology. He expects to assume his duties about March 15. The directorship of the department has been vacant since late last year when Dr. HANS G. SCHLUMBERGER was seriously injured in an automobile accident and was unable to return to the Medical Center. Dr. Norman had worked under Dr. Schlumberger before moving to Tulane in July, 1960.

Boston

Beginning next fall, Boston University will offer an accelerated program permitting students to complete college and graduate medical training in six years instead of the traditional eight. Open only to exceptionally gifted students, the six-year medical students will attend classes eleven months a year instead of the customary nine months. Graduates of the program will receive both a B.A. and an M.D. degree.

In announcing the streamlined program, Boston University's President HAROLD C. CASE said the course will eliminate the repetition of subjects already studied in high school.

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The program's initial four years will be financed in part by a \$550,000 grant from the Commonwealth Fund of New York.

Dr. HERBERT L. MARGOLIS has been appointed professor and chairman of the section of orthodontics in the department of stomatology at the School of Medicine. Past president of the Massachusetts Dental Society and the American Academy of Dental Science, Margolis is chairman of the orthodontics section at the A.S. Burg dental clinic in the Massachusetts Memorial Hospitals. He will direct the graduate program in orthodontics at the university.

Dr. ROBERT W. WILKINS, professor of medicine, has been named chairman of the division of medicine.

U. of California (San Francisco)

A team of four researchers in the basic processes of muscle function has joined the staff of the Cardiovascular Research Institute at the Medical Center. The scientists are Dr. MANUEL F. MORALES, recently named a Career Investigator of the American Heart Association; his wife, Dr. JEAN BOTT; Dr. SHIZUO WATANABE; and Dr. JEN TSI YANG. The new U. C. research team came to San Francisco from the Dartmouth Medical School department of biochemistry, of which Dr. Morales was chairman.

Dr. Morales is one of nine American scientists honored by a lifetime award of the American Heart Association since these positions were created a decade ago. Dr. Watanabe holds a five-year appointment as an American Heart Association Established Investigator, and the group is receiving research support for its work from the AHA and five California county Heart Associations.

The Cardiovascular Research Institute is headed by Dr. JULIUS H. COMROE, Jr.

U. of Chicago

An entire floor devoted to the care of heart and lung surgery patients will be constructed at the medical center. To be completed in about six months, the 22-bed surgical unit "represents a drastic departure from the thinking of many hospital administrators that patients should be moved from one unit to another during their hospitalization by stages of their convalescent care" said RAY BROWN, superintendent of the University of Chicago Clinics. The thoracic surgery unit will have its own treatment rooms. Triple oxygen outlets and vacuum outlets will be next to each bed and there will be an intercom system between each bedside and the nursing station. Both children and adults will be assigned to the new floor.

Dr. LOWELL T. COGGESHALL, vice president for medical affairs, was given the 1960 honor award of the American Medical Writer's Association recently at its 17th annual meeting in Chicago.

Dr. DONALD J. FERGUSON has been appointed professor of surgery. Since 1954, Dr. Ferguson has been chief of surgical service at the Minneapolis Veterans Administration Hospital and since 1958 has been a professor of surgery at the University of Minnesota.

Dr. WRIGHT R. ADAMS, professor and chairman of the department of medicine, was elected president of the University of Chicago Cancer Research Foundation at its annual meeting December 1, in Chicago.

Cincinnati

Cincinnati voters, at the November 8 election, approved two issues which will strengthen the position of the College of Medicine.

One was a \$17 million bond issue to construct a 450-bed hospital on the grounds of the Cincinnati General Hos-

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pital and to provide funds for remodeling the hospital's pavilion-type buildings. The other was an amendment to the City Charter giving the University of Cincinnati full responsibility for the hospital's administration. While staff appointments, teaching and research have always been under the authority of the university, the City Manager is responsible for the general operation of maintenance and basic hospital care. According to Dr. STANLEY DORST, Dean of the College of Medicine, this change to a straight line pattern of administration will insure a more efficient university medical center.

The \$17 million now available will complete a building program, beginning in 1954, which involved the erection of the Mont Reid Pavilion and construction of the new Receiving Ward; the completion of the William B. Wherry wing on the medical school for basic science research; and an addition to the Christian R. Holmes Hospital.

Dr. IRVING L. SCHWARTZ, of the Brookhaven National Laboratory, Upton, N.Y., has been appointed to fill the Joseph Eichberg chair of physiology. Dr. Schwartz will become professor of physiology and director of the department. With Brookhaven since 1956, Dr. Schwartz will assume his new position in February.

Dr. MAURICE LEVINE, professor of psychiatry and director of the department, has been appointed to the International Editorial Board, a group which will be in charge of publication of a new series of books and monographs in psychosomatic medicine. The series will be called "Mind and Medicine" and will be published by Tavistock Publications of London, England.

Columbia

The College of Physicians and Surgeons has established the Simon Baruch Chair of Physical Medicine and Rehabil-

itation in honor of the pioneer of hydrotherapy. Dr. Baruch, who died in 1921 and who was the father of Bernard M. Baruch, was the first professor of hydrotherapy in this country and held the chair of hydrotherapy at Columbia from 1907 to 1913.

Dr. ROBERT C. DARLING, professor of physical medicine, has been selected to hold the first Baruch professorship.

Cornell

Dr. RICHARD H. SAUNDERS has been named Associate Dean of the Medical College and assistant professor of medicine. The new Associate Dean has taught clinical pathology and medicine at the medical schools of Yale University and the Universities of Rochester and Vermont. He also was associate director of medical education and an attending physician at Highland Hospital, Rochester.

Dr. Saunders has recently served as director of a study committee for the Association of American Medical Colleges investigating the internship training programs. Among his duties as Associate Dean will be consultation with fourth-year students selecting internships.

Construction of a new research and library building, which is expected to cost \$3.6 million, got under way recently at the Medical College.

The new building will be a seven-story structure and will be named the Samuel J. Wood Library and Research Building in memory of the late Manhattan and Westchester realtor. Cornell received a grant of \$1.7 million from the Samuel J. and Evelyn L. Wood Foundation of New York last year and a grant of \$1.3 million from the Public Health Service. Balance of the funds will be provided by the university.

Duke

Dr. WILEY D. FORBUS, professor and former chairman of the pathology depart-

ment, has accepted an assignment to head the reorganization of a medical school in Indonesia. On leave from the Duke faculty, he will spend the next two years at the medical school of Airlangga University in Surabaja, located near the eastern end of the island of Java.

The project is being conducted by the University of California under contract with the International Cooperative Administration, part of the U.S. foreign aid program. Dr. Forbus will serve on California's staff as director of that institution's program to rehabilitate the Indonesian medical school.

Four new faculty appointments have been made in the school's pathology department. Dr. THOMAS D. KINNEY has been named professor and chairman of the department, succeeding Dr. Wiley D. Forbus, who will remain on the faculty until his retirement in 1963. Before coming to Duke, Dr. Kinney was professor of pathology at Western Reserve University Medical School.

Other newly appointed pathology faculty members, all of whom previously taught at Western Reserve, are: Dr. NATHAN KAUFMAN and Dr. DONALD B. HACKEL, both professors of pathology; and Dr. JANIS KLABINS, associate professor of pathology.

Coming from the State University of Iowa is Dr. CHARLES TANFORD, who has been named professor of physical biochemistry.

Harvard

Harvard will seek \$58 million to strengthen its medical education program, according to a recent announcement by Dr. NATHAN M. PUSEY, President of the university.

Major aim of the program, which already has \$21,627,838 in gifts or

pledges, is to provide more full-time tenure appointments, increased salaries, and more unrestricted capital to develop promising areas for advance in medical teaching and research. The only building included in the \$58 million program is the new Francis A. Countway Library of Medicine that will house the Harvard and Boston Medical Libraries.

Illinois

The governor-elect of Illinois has selected Dr. FRANCIS J. GERTY to be director of the Department of Public Welfare, which operates Illinois' state mental hospitals. Dr. Gerty is professor and head of the department of psychiatry at the College of Medicine, chairman of the neuropsychiatry department of St. Luke's-Presbyterian Hospital, Chicago, and former president of the American Psychiatric Association.

Iowa

A memorial endowment fund of \$100,000 has been established by a former Iowa doctor to provide scholarships for State University of Iowa medical students. Dr. THEODORE A. WILLIS, now of San Mateo, Calif., gave the funds to establish the William A. and Laura R. Willis Endowment Fund in memory of his parents. Income from the fund will be used to provide several scholarships yearly for medical students.

Jefferson

Two members of the College's administrative staff have been given promotions, according to a recent announcement by Dr. WILLIAM A. SODEMAN, Dean of the school.

Dr. ROBERT BRUCE NYE has been named Associate Dean, after having served as Assistant Dean since 1950. Dr. SAMUEL

S. CONLEY, Jr., now assistant to the dean, has been appointed Assistant Dean.

Dr. Nye, a cardiologist, has been with Jefferson since his graduation there in 1927 except for the year 1938 spent in graduate work in cardiology at St. Bartholomew's Hospital of the University of London, and World War II service as a colonel in the Army Medical Corps.

Dr. Conley joined the Jefferson faculty in 1947. He is associate professor of physiology and coordinator of medical education for National Defense at Jefferson.

Johns Hopkins

The School of Medicine has received a grant of \$235,000 from the Commonwealth Fund to develop a coordinated program of post-doctoral medical education. In announcing the gift, Dean THOMAS B. TURNER pointed out that the various programs to provide continuing education to physicians have grown to such an extent that post-doctoral students at Johns Hopkins now outnumber medical students 424 to 336. He added that the present programs consist largely of research work and study and clinical application of patient treatment techniques, and no formal curriculum has been established in the post-doctoral area. Thus, the Commonwealth grant will enable Johns Hopkins to plan for an accelerated program in post-doctoral courses, since the shortened pre-doctoral program is "succeeding beyond expectations."

Dr. E. COWLES ANDRUS has been promoted to the rank of professor of medicine. He has been chief of the cardiovascular division of the department of medicine since 1957.

Mayo

Dr. RANDALL G. SPRAGUE, head of a section of general medicine, was named

president of the staff of the Mayo Clinic. He succeeds Dr. CHARLES A. OWEN, Jr., who became president of the staff a year ago.

Maryland

The School of Medicine has established a department of biophysics and named Dr. LORIN J. MULLINS as professor and head of the new department. Dr. Mullins has been at the school for a year as visiting professor of biophysics under a Public Health Service training grant. He was formerly associate professor of biophysics at Purdue University.

Made possible by a grant from the Division of General Medical Sciences of the NIH, the new department will offer instruction to medical students, graduate students working toward advanced degrees in medical research, and post-doctoral fellows in various departments of the professional schools.

Dr. EDWARD J. HERBST has been promoted to full professorship in the department of biochemistry. On the Maryland faculty since 1949, Dr. Herbst has been serving as acting head of biological chemistry since April 1958.

Michigan

Dr. JEROME W. CONN, professor of internal medicine, has been selected as a Henry Russel Lecturer, the highest honor the University of Michigan bestows on a faculty member. The Lectureship, carrying an honorarium of \$1,250 and \$750 for the award, is awarded annually to a faculty member of associate professorship or higher who is judged to have achieved highest distinction in his field of scholarship. Dr. Conn has been on the U-M faculty since 1934.

The university dedicated its new pharmaceutical research building recently with the sobering note that it would shortly be inadequate for the expanding

scientific needs of pharmacy. Erected at a cost of \$1,250,000, the new building contains over 35,000 square feet of floor space devoted mainly to small research laboratories for graduate students and special rooms and facilities for drug preparation.

Missouri

Dr. WILLIAM D. MAYER of the University of Rochester School of Medicine and Dentistry, has been appointed Assistant Dean of the School of Medicine, and will assume the position next June 1. Dr. Mayer, who will also hold the title of assistant professor of pathology, will have charge of student affairs and will be chairman of the Medical School Admissions Committee. He received his M.D. degree from the University of Rochester in 1957, where he served his internship during 1957-58. He has been on the Rochester faculty since 1958.

New York University

One million dollars for the study and treatment of children's illnesses was presented to the New York University Medical Center recently by the William J. Wollman Foundation. With this amount the university will establish the William J. Wollman Memorial Pavilion for Children at the Medical Center's University Hospital. Scheduled for completion in 1962, the pavilion will consist of 60 beds for inpatient care, outpatient clinics, laboratories and special classrooms for research and teaching under the direction of the Center's department of pediatrics, and supervised by Dr. SAUL KRUGMAN, professor and chairman.

The New York Medical Center is offering a three-months training fellowship with stipend of about \$1,000 in neuroanatomy and neurophysiology, beginning March 1, 1961. Candidates holding the M.D. or Ph.D. degree and inter-

ested in teaching or research in these subjects are eligible. Applications should be in by February 1, 1961. Write to Dr. LOUIS HOUSMAN, Department of Anatomy for further information.

Northwestern

Seven doctors on Northwestern's faculty of medicine have been promoted to the rank of full professor. The promotions include: Dr. CRAIG BORDEN, medicine; Dr. HUTTON SLADE, microbiology; Dr. JOHN W. HUFFMAN and Dr. AUGUSTA WEBSTER, obstetrics and gynecology; Dr. DAVID HSIA and Dr. IRVING SCHULMAN, pediatrics; and Dr. FREDERICK PRESTON, surgery.

Pittsburgh

The first successful synthesis of the cortisone-producing hormone ACTH has been achieved by a team of University of Pittsburgh researchers, according to a recent announcement from the university's Health Center. The synthesis was accomplished by a group of biochemists under the direction of Dr. KLAUS HOFMANN, chairman of the biochemistry department. Although the full significance of the achievement is difficult to predict, Dr. Hofmann believes it is possible that it could help clarify the functions of the pea-sized pituitary gland; allow medical scientists to work with pure ACTH; it could lead to an understanding of how the pituitary gland stimulates the adrenal gland's cortex to produce cortisone and other important steroid hormones; and the techniques developed can now be used to modify the natural structure of ACTH in hopes of achieving medically important results.

Members of Dr. Hofmann's research group include Dr. HARUAKI YAJIMA, Dr. and Mrs. NOBORU YANAIHARA, TEH-YUNG LIU, SAUL LANDE, and JOHN L. HUMES.

Rochester

A comprehensive Center for Brain Research, designed to utilize the knowledge and skills of every field of study involved in investigating how the brain functions, will be established at the University of Rochester next semester, according to the university's President, Dr. C. W. DE KIEWIET. The Center will be headed by Dr. E. ROY JOHN, associate professor of psychology and will be associated with the department of psychology in the College of Arts and Science. Working closely with other departments of the College of Arts and Science and with the School of Medicine and Dentistry and the College of Engineering, establishment of the Center will fulfill the conviction of the university that "brain research is going to be one of the most important areas of basic science in the coming decade and one that promises major advances in mental health and medicine in general."

Dr. LEE B. LUSTED, associate professor of radiation in the School of Medicine and Dentistry, has been made associate professor of bio-medical engineering in the new program established in the UR College of Engineering. The bio-medical engineering program leading to the Ph.D. degree in electrical engineering with special application to the fields of medicine and the life sciences will be operated by the College of Engineering in cooperation with the Medical School. It was created under a NIH grant of \$254,407 to the university.

Seton Hall

Dr. VIRGINIA N. WILKING, former associate in psychiatry at Columbia University, joined the Seton Hall faculty as professor of psychiatry. Her prime responsibility will be in the area of child psychiatry and she will also service the department of pediatrics. Dr. Wilking was also associated with the Seizure

Clinic of the Columbia Presbyterian Medical Center.

Stanford

Two new assistant professors of neurology joined the Stanford faculty on December 1. They are Dr. GILBERT S. FRANK, of San Francisco, and Dr. ANTHONY M. IANNONE, formerly at the University of Minnesota.

S.U.N.Y. (Syracuse)

The medical school has joined with the Utica Children's Hospital in establishing a combined program in orthopedic surgery. A resident in orthopedic surgery at the College of Medicine in Syracuse will spend one year of his graduate education caring for patients at the Children's Hospital Home under the supervision of the attending staff and the chairman of the surgical and orthopedic surgical program at the College. The resident will be under the direct supervision of Dr. ELIOT FRIEDMAN, chief of staff, and Dr. A. R. HATFIELD, chief of physical medicine at the Children's department of surgery in Syracuse, and Dr. JAMES WRAY, chairman of the section of orthopedic surgery. Dr. Wray recently joined the medical faculty at S.U.N.Y. after having served on the Bowman Gray medical faculty since 1957.

Stritch

Dr. BENJAMIN H. ORNDOFF, professor and chairman of radiology, was given Loyola University's first Stritch award medal for outstanding services to medicine and medical education. Established in memory of Cardinal Samuel A. Stritch, late Roman Catholic archbishop of Chicago, the award was made at a fund-raising banquet held recently in Chicago's Conrad Hilton hotel. Proceeds from the banquet will be used to help the medical school defray its operating costs.

Temple

Dr. WALTER H. MALONE has been named clinical professor of laryngology and bronchoesophagology. Dr. Maloney comes to Temple University from Western Reserve University where he has served as associate professor and director of otolaryngology during the past year. He also held the post of director of the otolaryngology division at the University Hospitals of Cleveland.

Tufts

The Medical School plans to start work immediately on expansion of its medical research program by converting a commercial building to academic use. The \$2 million conversion job was made possible by a \$677,000 Federal grant, a \$375,000 state grant and other gifts. The building will also contain classrooms for the Boston School of Occupational Therapy, recently incorporated into Tufts.

Medical College of Virginia

EDWIN F. ROSINSKI, Ed.D., consultant in medical education at the Medical College of Virginia since July 1959, has been appointed associate professor and director of the newly created office of Research in Medical Education in the Medical School. According to Dean WILLIAM F. MALONEY, this action indicates the degree to which these activities have become integrated as a permanent part of the educational program at the medical college.

Prior to his appointment at Virginia, Dr. Rosinski had been director of the research project in medical education at the University of Buffalo School of Medicine where he received his doctorate in education.

Dr. RICHARD G. LESTER of the University of Minnesota has been named chairman of the radiology department. He will take over his new position April 1, suc-

ceeding Dr. FREDERICK B. MANDEVILLE, who will continue as professor of radiology.

U. of Virginia

The new \$6.5 million addition to the University of Virginia Hospital went into operation early in December, with formal dedication ceremonies scheduled for next April. The new hospital provides 419 beds, thus permitting the closing down of all wards now located in the old original hospital buildings that are not fireproof. The hospital's total bed capacity will be approximately 620 beds. The eight-story structure, financed largely with state appropriations augmented by Hill-Burton funds, is one of the largest single building projects ever contracted for by the university and the state.

Wayne State

A new concept in higher education—the University Professorship—has been established at Wayne State University, and named the first "University Professor" is Dr. JOHN M. DORSEY, professor and chairman of the department of psychiatry in the College of Medicine. Supported by a five-year grant of \$110,000 from the McGregor Fund, the program will go into effect February 1.

As outlined by Wayne State's President CLARENCE B. HILBERRY, the University President is attached to no specific department, thus freeing him to teach a limited amount of regular credit courses, which would serve a wide usefulness to the student body. He will be available for informal contacts with students and faculty, for bringing his wide reading and his own creative work to bear on the life of the campus, said Dr. Hilberry. "He will also be responsible for bringing to the campus, for lectures and visits, men who can represent to the

student body the values of 'wholeness of vision'."

Dr. Dorsey has chaired the psychiatry department since joining the university in 1946. He has been instrumental in both organization and support of most mental health activities in southern Michigan.

Western Reserve

Dr. KENNETH J. RYAN, instructor in obstetrics and gynecology at Harvard Medical School, has been named professor and head of the department of obstetrics and gynecology at Western Reserve. He also was named director of the department at University Hospitals. The appointments are effective July 1. He succeeds Dr. ALLAN C. BARNES, who

resigned to head the obstetrics and gynecology department at John Hopkins University last July 1.

Woman's Medical College

A medical journal now has a woman at its head with the appointment of Dr. KATHARINE R. BOUCOT, professor of preventive medicine, as editor of *The Archives of Environmental Health*. This is a specialty publication of the AMA that was founded in 1919 and never before had a woman editor.

Author of 51 published articles, Dr. Boucot is vice president of the American Thoracic Society, serves on the Germantown (Pa.) Community Council, and is a member of the Philadelphia Club of Medical Women.

ITEMS OF CURRENT INTEREST

NIH Career Professorships

The National Institutes of Health has upped their appropriations for career research professorships to include an additional \$10,000 "supply" grant, plus eight per cent more for the school's indirect costs. The \$10,000 may be used by the institution to cover the professor's expenses, including the school's portion of retirement payments and Social Security, fringe benefits, travel, research equipment, and other related costs.

Two million was the original figure authorized by Congress for career professorships in research—providing \$20,000 to \$25,000 a year to approximately 100 investigators. NIH is now allotting nearly \$1 million from its regular extramural project grant budget for the "supply" grants. The plan is aimed at stabilizing the federal medical research program, which has grown so large that it is affecting all phases of medical school programs and policies.

Medical (including osteopathic), dental and public health schools were urged by NIH to "consider using the career research professorship to give tenure appointments to scientists receiving salaries from research grants and contracts." With a deadline of January 1 for receipt of applications, the schools were permitted to nominate up to four candidates. The grants will be used only to pay the full salaries of the recipient investigator. Since each research professor grant will represent a full-time, 12-month salary for the recipient, NIH will not permit it to be supplemented from institutional or other funds. However, research professors may apply for regular research project grants from NIH and elsewhere to finance additional research expenses. All the professorships will be made initially in the form of five-year grants, renewable every five years "unless other funds providing stable career support become available."

Grant for New Medical School

The University of Connecticut has accepted a \$1,030,000 grant from the W. H. Kellogg Foundation to aid in establishing a two-year medical school at Hartford. The award will be made over a three-year period; \$51,300 being allocated for study of the proposed teaching facility the first year, and \$68,100 to expand the study and staff needs, for curriculum, development, hospital agreements and operating costs.

In addition, \$118,000 would be allocated during the third year for engineering and architect's costs. The balance, \$800,000, to partly finance construction, would be made before the end of the three-year period.

Thomas Park to Presidency of AAAS

Professor Thomas Park of the University of Chicago will take office as president of the American Association for Advancement of Science January 15. He succeeds Dr. Chauncey D. Leake of Ohio State University as head of the organization which held its 127th annual meeting December 26-31 in New York City. The AAAS is the world's largest group of related scientific organizations. It has 60,000 members and is affiliated with 291 societies.

Dr. Park joined the University of Chicago faculty in 1937 and is professor of zoology. He served as associate dean of the school's Division of Biological Sciences from 1943 to 1946.

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South America, and the Caribbean. Nurses and technologists are also needed by the organization.

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More Work for HEW's Dr. Allen

Dr. Ernest M. Allen, Chief of the Division of Research Grants and Associate Director for Research Grants at the National Institutes of Health, has been given full-time staff responsibility as Associate Director, according to Surgeon General Leroy E. Burney. The reassignment, recommended by Dr. James A. Shannon, Director of the NIH, was brought about by the rapid growth and complexity of research grant activities of the Institutes.

Operating responsibilities for the Division of Research Grants will be carried out by Dr. Dale R. Lindsay, who has been appointed Chief of the Division. He will be assisted by Dr. Clinton C. Powell, who has been named Deputy Chief.

An Agreement to Aid Medical Research

An agreement to aid in the administration of medical research activities in the countries of the Americas was announced jointly by the Pan American Health Organization and the U. S. Public Health Service. The agreement focused on three primary points: staff collaboration between the two organizations; development of PAHO research activities; and definition of forms of Public Health Service aid that might be applied to PAHO research activities.

The Pan American Health Organization will provide moderate financial sup-

port to certain research projects and programs, conduct research by its own staff, provide coordination for research projects involving more than one country, and aid in the development of scientists, scientific communication, and other medical research activities.

The Public Health Service will provide technical advice on research design. In addition, PHS will consider research grant proposals from investigators who may wish to participate in research programs coordinated by PAHO and applications for support to PAHO for research conducted or coordinated by PAHO staff.

Fellowships and Scholarships

Available

To help provide specialized training for persons working with crippled children and handicapped adults, fellowship and scholarship awards are available from the National Society for Crippled Children and Adults.

March 15, is the deadline for filing fellowships applications. These awards are available to counselors, employment interviewers, placement personnel and other professionally qualified persons working with the handicapped whose responsibility includes vocational counseling and job placement.

The deadline for filing scholarship applications is April 1. These awards are available to professional personnel including orthopedic surgeons, neurologists, pediatricians, physiatrists, and other medical specialists; physical and occupational therapists; speech pathologists and therapists; and others who work with the crippled such as educators, psychologists, social workers and nurses.

Full particulars and application forms can be secured from the Personnel Service of the National Society for Crippled Children and Adults, 2023 West Ogden Ave., Chicago, Ill.

Bone Banks Established

Temporal bone banks to forward research in loss of hearing, have been established in five universities by the Deafness Research Foundation since June 30, 1960.

Located at Columbia University College of Physicians and Surgeons, New York University Medical Center, Johns Hopkins University School of Medicine, University of Chicago, and the University of Michigan, the Banks are directed by the chiefs of staff of the departments of otolaryngology. The Temporal Bone Banks, unlike the Eye Banks, are for basic research rather than for transplants. In laboratories throughout the country, inner ear findings will be correlated with the examination of the patient's history and records. Informa-

tion provided by this research will also be made accessible to trainees in otology, and will be used to help train laboratory technicians in ear studies.

Dr. Bronk Named Member of Brazilian Academy

Dr. Detlev Bronk, President of The Rockefeller Institute, has been elected an honorary member of the Brazilian Academy of Science and has been made an Honorary Doctor of the University of Brazil at a special university convocation.

Dr. Bronk, who is also President of the National Academy of Sciences of the United States, made an extensive trip through Brazil in order to advise on the development of science in that country as a basis for its industrial development.

PERSONNEL EXCHANGE

Faculty Vacancies

VIROLOGIST: To associate with studies on the epidemiology of virus diseases. Research and teaching position in medical school in mid-South. Opportunity for independent work. Ph.D. or M.D. Salary and rank according to qualifications. Address: V-101.

PSYCHIATRIST: On research ward, VA Hospital, Houston, Texas. Current research activity primarily focused on biochemical, physiological, and psychological aspects of schizophrenia. Numerous scientist collaborators, facilities available for pursuit of individual research problems. Hospital closely affiliated with Baylor University College of Medicine and Texas Medical Center. Salary up to \$17,200 depending on individual qualifications. Write Alex D. Pokorny M.D., Chief, Psychiatry and Neurology Service, VA Hospital, Houston, Texas.

VIRUS RESEARCH: M.D. or Ph.D. interested in infectious diseases, basic studies on mechanisms of infection and on etiology, pathogenesis and epidemiology of virus diseases of infancy and childhood. Excellent facilities. Salary \$6,000 per annum. Address: V-102.

MICROBIOLOGIST: Research and teaching in medical school in the Northeast. Background in virology preferred. Opportunity for independent research. The rank is that of instructor, with salary dependent on qualifications. Address: V-103.

PEDIATRICIAN: Full-time instructor or assistant professor with salary based on training and experience. Can build own interest in newly reorganized department of a rapidly developing private university. Mail curriculum vitae to T. R. Pfundt, M.D., Chairman, Department of Pediatrics, The Creighton University School of Medicine, 302 N. 14th St., Omaha 2, Nebr.

INTERNIST: Certified in Internal Medicine, preferably with Fellowship, for consultant practice in a teaching hospital in Ontario, Canada. Office and secretarial assistance provided. Basic salary and salary ceiling to be arranged. Address: V-104.

HEALTH-PHYSICIST-BIOPHYSICIST: To assume major responsibility for health physics teaching and research in large Eastern university's radiation health program for medical and public health graduate students. Full-time faculty position with independent research and consultation opportunities. Salary and rank dependent on academic qualifications and experience. Send curriculum vitae. Address: V-105.

PATHOLOGIST: Midwest medical school. Teaching of anatomical and clinical pathology. Interest and experience in research desirable. Academic rank based upon qualifications. Salary with consultation privileges. Address: V-106.

MICROBIOLOGIST: Applications are invited for consideration to a position as departmental chairman and professor of microbiology at the State University of South Dakota School of Medicine, Vermillion, S.D. Correspondence may be directed to the Office of the Dean.

ASSOCIATE PATHOLOGIST: VA General Hospital associated with Duke University School of Medicine seeks a pathologist certified in clinical pathology who will direct residents in clinical pathology and will carry on research in one of the branches in clinical pathology. Faculty appointment appropriate for qualifications. Expanding research program. Salary \$14,041 to \$17,200. Write to Roger Baker, M.D., VA Hospital, Durham, N.C.

ANESTHESIOLOGIST: Full-time appointment as Assistant Chief VA Hospital closely affiliated with medical school. Opportunity for teaching, research, and clinical experience in all physician service. Full resident staff. Licensure (but not necessarily in Utah) required. Prefer board certification. Salary depends on qualifications, \$10,635 to \$15,790 plus other benefits. Include curriculum vitae or VA application in letter. Contact: Carter M. Ballinger, M.D., Division of Anesthesiology, University of Utah, Salt Lake City, Utah.

PHYSIOLOGIST: Applications are invited for the position of Assistant Professor of Physiology, salary dependent on qualifications, \$6,000 minimum. Preference will be given to applicant with special knowledge of biophysics. Opportunity for research. Teaching duties not excessive. Apply to Dr. C. B. Weld, Head, Department of Physiology, Faculty of Medicine, Dalhousie University, Halifax, Nova Scotia, Canada.

MEDICAL EDUCATION CO-ORDINATOR: Thoroughly progressive midwestern private general hospital seeks a full-time M.D. possessing extraordinary knowledge of the basic sciences, disease entities, teaching responsibilities plus capacity to utilize qualified members of present staff. Must have experience of teaching principles as applied to intern and resident programs in hospitals, university medical schools or non-university teaching hospitals. Address: V-107.

To aid in solution of the problem of faculty vacancies, MEDICAL EDUCATION will list persons and positions available, as a free service. The school department or person may have the option of being identified in these columns or of being assigned a key number for each position listed. Mail addressed to key numbers will be forwarded to the person or department listing the request.

Information for these columns should reach the Personnel Exchange, Journal of Medical Education, 2530 Ridge Avenue, Evanston, Illinois, not later than the 10th of the month which precedes the month in which the listings will appear.

Personnel Available

INTERNIST: M.D., age 40. Experienced in teaching, clinical investigation (metabolism), patient care, and administration. Desires full-time post with teaching hospital—medical school. Address: A-456.

EXFOLIATIVE CYTOLOGIST: M.D., with 12 years' training. University experience in teaching and research (cytohistochemistry). Desires appointment in a university department or in cancer institute with exfoliative cytology program and opportunities for research. Address: A-457.

PHARMACOLOGIST: M.D., Ph.D., age 36, married. Seven years teaching and research experience in structure-activity-relationships. Desires academic position with facilities and atmosphere conducive to develop research program. Address: A-458.

GENERAL SURGEON: M.D., F.R.C.S.(C). Board eligible. Excellent references. Age 35. Teaching experience in anatomy, pathology and surgery. Desires association with hospital, medical school, or group with part-time teaching responsibilities. Address: A-459.

PHYSIOLOGIST: Ph.D., male, age 31, 1958 graduate with teaching experience in medical schools. Interested in academic position in medical school with research opportunities. Present rank, Assistant Professor. Currently on NIH research grant. Available fall 1961 (possibly spring 1961). Address: A-461.

INTERNIST: F.A.C.P., age 43. Consulting physician in large Eastern charity hospital desires full-time position in department of medicine at Professor of Clinical Medicine level. Primarily interested in metabolism but will consider other sections. Broad training in most subspecialties; basic experience with isotopes. Extensive clinical investigation. Numerous publications since 1947. Diplomate American Board Internal Medicine. Address: A-462.

PHYSIOLOGIST-BIOCHEMIST: Ph.D., faculty member Medical School. Experienced with isotopic and biochemical techniques applied to basic problems in endocrinology, metabolism, and cellular physiology. Publications

and societies. Teaching experience. Desires career faculty appointment in physiology or biochemistry with opportunity for independent research. Address: A-463.

PHYSIOLOGIST: M.D., age 35, male, family. Currently in charge of course as associate professor of physiology in Latin American medical school. Approximately 5 years experience in pathology and research laboratories in U.S. Desires teaching position in physiology at U.S. Medical School. Address: A-464.

GENERAL AND THORACIC SURGEON: Certified both Boards and eight years training including research fellowships. Experience includes cardiac surgery. Desires academic position with opportunity for research; minimal clinic load to remain familiar with problems in applied surgery. Administrative responsibilities easily accepted. Address: A-465.

PATHOLOGIST: Certified P.A. and C.P., 1950. Eleven years, teaching experience. Special interests: cytologic diagnosis, chest and tuberculosis pathology. Now engaged in hospital pathology and wishes to return to full-time teaching and research. Address: A-466.

NEUROLOGICAL SURGEON: Age 36, unmarried. Desires academic position for clinical investigation with access to teaching and research. Would also consider a position in a City, County, or Federal Institution affiliated with a medical school. Address: A-467.

PATHOLOGIST: Widely experienced, Board Diplomate (P.D.), Associate professor, director of laboratories. Desires teaching position with a minimum of administrative responsibility. Available Fall of 1961. Address: A-468.

PATHOLOGIST: Age 37. Certified in clinical and anatomical pathology. Presently on medical school faculty. Desires to combine directorship of hospital laboratory with teaching or hospital educational program. Administrative experience. Address: A-469.

SURGEON—THORACIC: Age 35, four children. M.D., 1951. A.O.A. Medical school residency five years. Diplomate American

Board of Surgery and Thoracic Surgery. F.A.C.S. Desires position in surgical department of medical school, with emphasis on teaching and clinical work with opportunity for research. Wishes to locate in South-eastern section of U.S. Address: A-470.

PARASITOLOGIST—PUBLIC HEALTH: Ph.D., M.S. (Zoology), M.S.P.H. Age 32, married. Desires permanent position involving teaching and research. Experience includes teaching medical parasitology and bacteriology. Currently at work on a full year post-doctoral training program in parasitology. Available July 1, 1961. Address: A-471.

SURGEON: Age 34, M.B., B.S. (Univ. of London), F.R.C.S. (England). Wide experience in general surgery and teaching. Eight years, postgraduate training in teaching hospitals, including one year in basic science and research and one year as surgical resident in Canadian teaching hospital. Seeks full-time surgical appointment in U.S. medical school. Address: A-472.

PUBLIC HEALTH PHYSICIAN: B.A., M.D. Diplomate, American Board of Preventive Medicine. Fellow, American College of Preventive Medicine. Desires academic appointment with a School of Public Health or a Medical School with a public health course. Experienced in public health administration, public health practices, medical administration. Credentials on request. Address: A-473.

PEDIATRIC CARDIOLOGIST: Age 39, qualified for examination by American Board of Pediatric Cardiology. Now full-time, desires half-time university appointment. Catheterization laboratory necessary. Address: A-474.

MEDICAL ADMINISTRATOR: Harvard trained, Ph.D. Seeking position as medical school administrator-graduate school Dean. Board experience in administration, teaching, research and writing. Author and co-editor of several well-known medical books.

Vast experience in basic subjects and clinical subjects at Harvard and Harvard hospitals. Numerous publications. Address: A-475.

PHYSICIAN-PHYSIOLOGIST: M.D., Ph.D. Age 50. Extensive experience in cardiopulmonary research, clinical and laboratory; teaching and administration; numerous publications; research grants. Desires position with responsibility to develop research and teaching program. Address: A-476.

PHYSICIAN: M.D., D.P.H. Extensive experience in epidemiological research, teaching and administration in academic and health department settings. Published articles; book in preparation. Seeks senior university appointment offering opportunities in broad field of preventive medicine. Address: A-477.

INTERNALIST: M.D., Ph.D. Currently Assistant Professor of Medicine with administrative and teaching responsibility for attending and house staff and medical students on large medical service. Active, well-supported, independent research program. Training includes NIH and the University of Chicago. Numerous publications. Desires geographic full-time position or equivalent in medical school or affiliated hospital with facilities for expanding both clinical and laboratory aspects of research program. Address: A-478.

INTERNALIST: Certified; also certified in cardiovascular disease. Experience in medical school teaching as assistant professor at student, intern, resident and practicing physician level. Desires full-time position in teaching or community hospital and/or medical school. Address: A-479.

INTERNALIST—CARDIOLOGIST: Board certified. Age 35. One year training in clinical cardiology and one year in cardiovascular laboratory. Experience in university teaching. Presently visiting university instructor in England. Available July 1, 1961. Desires faculty appointment and hospital medicine. Address: A-480.

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1. Macy, L. G.; Kelly, H. J., and Sloan, R. E.; with the Consultation of the Committee on Maternal and Child Feeding of the Food and Nutrition Board, National Research Council: The Composition of Milks, Publication 254, National Academy of Sciences and National Research Council, Revised 1953. 2. Brown, G. W.; Tubolski, J. M.; Sauer, L. W.; Minsk, L. D., and Rosenstern, I.: Evaluation of Prepared Milks in Infant Nutrition; Use of the Latin Square Technique, *J. Pediat.* 56:391 (Mar.) 1960.



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